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The American Journal of School Hygiene

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VOL. III

MARCH, 1919

No. 1

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THE PROBLEM OF MALNUTRITION IN SCHOOL CHILDREN

BY LAWRENCE AUGUSTUS AVERILL

Editor of The American Journal of School Hygiene

When the crafty Squeers inducted Nicholas Nickleby into the schoolroom of his school at Dotheboys Hall, the latter gazed with much bewilderment, not to say compassion, upon the sadly neglected pupils. "Pale and haggard faces, lank and bony figures, children with the countenances of old men, deformities with irons upon their limbs, boys of stunted growth, and others whose long, meagre legs would hardly bear their stooping bodies, all crowded on the view together. There were the bleared eye, the hare-lip, the crooked foot and every ugliness of distortion that told of unnatural aversion conceived by parents for their offspring, or of young lives which, from the earliest dawn of infancy, had been one horrible endurance of cruelty and neglect. There were little faces which should have been handsome, darkened with the scowl of sullen, dogged suffering; there was childhood with the light of its eye quenched, its beauty gone, and its helplessness alone remaining; there were vicious-faced boys brooding with leaden eyes like malefactors in a jail; and there were young creatures on whom the sins of their frail parents had descended, weeping even for the mercenary nurses they had known, and lonesome even in the loneliness. With every kindly sympathy and affection blasted in its birth, with every young and healthy feeling flogged and starved down, with every revengeful passion that can foster in

swollen hearts, eating its evil way to their core in silence, what an incipient hell was breeding there!’” Or again, when Nicholas watched the slow gray dawn of morning steal into their common bed-chamber, “little could be distinguished but the sharp outlines of pale faces, with here and there a gaunt arm thrust forth: its thinness hidden by no covering, but fully exposed to view in all its shrunken ugliness. There were some who, lying on their backs with upturned faces and clenched hands, just visible in the leaden light, bore more the aspect of dead bodies than of living creatures, and there were others coiled up into strange and fantastic postures such as might have been taken for the uneasy efforts of pain to gain some temporary relief, rather than the freaks of slumber.”

One does not need to read the further experiences of young Nickleby at Dotheboys Hall to understand that the single chief evil of Squeers’ school was the absence of anything like adequate food for the pupils. Squeers’ school was a starvation school. When Dickens wrote, this evil was wide-spread. It is by no means eradicated today, and while the older private boarding-school idea, with all its possibilities of evil has disappeared, and with it that utter indifference to child welfare which made its continuance possible over a long period in English history, we have still the same problem of the undernourished child—the victim of malnutrition—in our great public school system.

Life is metabolism. From a strictly physiologic point of view, the daily program of living is completed when the requisite and proper food has been taken into the digestive tract, assimilated, and presented to the cells, and the concomitant katabolic products of oxidation collected and excreted, together with the storage in the liver and other warehouse cells of the excess amounts of fats and sugars. Beyond this program the daily metabolic processes of the human body do not proceed. In order to insure the carrying out of the program to perfection and with the maximum strain upon the internal organs of assimilation and digestion, however, it is essential in the first place that a sufficient amount of food be taken, and, in the second, that the right kinds be properly balanced. Malnutrition, or the starvation of the cells of the organism, may be due to one of two causes equally: (1) insufficient food; (2) improper food. Theoretically, at least, an organism might be surfeited with food, yet die of starvation of the cells. Actually, however, cell-starvation when due to improper foods in too large amounts comes about remotely, or indirectly, through the complications offered by a weakened resistance power

to disease or a general intestinal toxæmia which destroys the entire nutritional process, and so life.

In the case of the child in the midst of the growth impulse, any interference with normal and optimum nutrition is both immediate and disastrous. If life for the adult organism is metabolism, it is triply so for the child. One has but to cast about him to see innumerable victims of metabolic interference. The emaciated face and limbs; the dull, listless expression; the stunted development of muscle and the often dwarfed development of bone—all point to the condition of cellular starvation, either direct or remote. Such children belong often no more to the poorer and more ignorant classes than to the well-to-do and intelligent, although it is a fact that on the whole the undernourished child in any school system comes from the homes of the less intelligent. There are varying degrees of malnutrition, from the child whose vigor is seriously threatened by carbohydrate excesses, through the child who is actually getting an insufficient amount of nutriment from his dietary, to the child who presents the tell-tale symptoms of extreme cell-starvation. Normal growth and a normal rate of development physically presupposes and depends upon normal metabolism. Even in the case of disease, defect or illness of any sort, it is probable that the ultimate underlying causation is an interference in and derangement of the process of metabolism, or of its allied processes. Thus the health and happiness of the child may depend directly upon his dietary, and when one considers the naturally low resistance power of children to disease, the supreme importance of a proper and properly balanced dietary, is much enhanced.

THE REMARKABLE PREVALENCE OF MALNUTRITION AMONG SCHOOL CHILDREN

Dr. Wile (28) has summed up the results of many studies into the gross prevalence of malnutrition among school children and pre-school children. Thus: Dr. McMillan of Chicago found 15.9% kindergarten children physically below par, and estimated that underfeeding was the cause of 11% in kindergartens and 7.8% in other grades. Dr. MacKenzie regards $\frac{1}{3}$ of all the school children in Edinburgh as poorly nourished. Dr. Maxwell is reported as saying to the National Education Association in 1904 that there are hundreds of thousands of children unable to learn because of hunger. Dr. Francis Warner and Hack Tuke found 28.5% of London school children suffering from deficient feeding.

The New York Committee on the Physical Welfare of School Children in 1907 declared 13% of 990 children examined to be suffering from malnutrition, and Dr. Sill in 1909 estimated that 40% of the children in the elementary schools of New York City were illy nourished. The New York School Lunch Committee in 1910 in an examination of 2,150 children adjudged 13% to be marked cases of malnutrition. In Chicago, in 1908, of over 10,000 children examined, 12% were reported as suffering from malnutrition. In Boston, in 1909, underfeeding was found in 16% of over 5,000 children. In Philadelphia, 24% of 500 children examined were found to be suffering from underfeeding. In St. Paul, in 1910, 20% of 3,200 children in schools in the poorer districts were reported as manifesting the evidences of marked underfeeding.

Sir George Newman, in a report to the British Board of Education, found poor nutrition present in by far the great majority of children living in 13 counties and 16 urban areas.

Dr. Echholz estimates the number of undernourished children in London to be 122,000. Sill (22) quotes Dr. H. M. Lechstrecker's study under the New York State Board of Charities to the effect that only 17.32% of the 10,707 children in the industrial schools of New York start the day with an adequate meal.

Spargo (24), in 1906, examined the breakfast and lunches of 12,800 children in 16 public schools of New York City. The inquiry revealed that 987, or nearly 8%, came to school habitually without having had any breakfast at all; and that 1,963 others, or more than 15% of the total number examined, failed to have anything like an adequate morning meal, *i. e.*, they had only tea or coffee with or without bread, or cake, or crackers. The type of luncheon which many of the children got was little better. From 10% to 20% were given pennies to buy whatever they might wish. Spargo noted what they actually purchased, and discovered that the favored menus were composed entirely of pickles, pickles and bread, bologna, pickled fish, ice-cream, bananas and candy. Many of the pennies were used to gamble with. Many of the children had no pennies and remained throughout the entire noon hour playing about the grounds.

In 1905, an examination of the dietaries of school children in six large cities, reported in the *Philadelphia North American*, (21) revealed startling conditions. In Chicago, of 5,150 children in 5 schools, 31% reported either an inadequate breakfast or none at all; in Buffalo, of 7,500 children, in 8 schools, 5,105 reported a breakfast of tea or coffee and bread. According to the principals

of these schools, 15% of all the children examined were seriously handicapped by poor nutrition. In Philadelphia, 4,589 children were examined, 189 reporting no breakfast, and 2,504 tea or coffee and bread, making a total of 59% coming to school inadequately fed.

In 1909, Sill (22) found upon careful medical diagnosis of 1,000 children (ranging from 6 to 12 years of age) at his clinic on the lower East Side of New York City, that 400 of them were badly undernourished. This sounds not unlike the testimony given 8 years later by Bowers (5) who quotes a New York physician to the effect that "My six hundred and fifty rejections out of a total of fifteen hundred examined simply reflects the condition of poverty in my district. It is safe to say that 40% of the young men on the East Side are unfit for military duty because of the lack of proper nourishment and the lack of clinics to minister to their needs." As ye sow, so shall ye reap. Nutritional want in the child spells nutritional want in the conscript.

Numerous other investigations into the extent of malnutrition in school children have been made within the past 10 years. Among them may be mentioned a series of special records kept by the Medical Inspection Department of the New York City schools (19); an investigation conducted by the New York Committee on Physical Welfare of School Children; a study made by the medical inspectors of the Chicago schools; and others. The general conclusion from these and other studies made both in this country and in Europe is that somewhere in the neighborhood of 10% of our elementary school population are seriously underfed, while another 10% or more are suffering from less acute starvation.

The study of Sill, above referred to, is undoubtedly one of the most illuminating studies of malnutrition thus far made, although the number of children included in the survey was not large. They were children of the lower East Side in New York City, and as such are representative of a much larger group than Dr. Sill was able actually to study. There were 210 malnutrition cases in his clinic, which were his subjects of investigation. Of them, 175 drank tea or coffee once a day at least. 25% had one or the other two and three times daily. 83% practically depended upon tea or coffee for their diet. 62% slept with closed windows; 21% retired at 8 o'clock; 40% at 9; 24% at 10; and 12% at 11, habitually—and all of them were under 10 years of age! 48.5% had no baths oftener than once a month; 4% had them only once a year! Dr. Sill also examined 1,000 children in the Jewish quar-

ter, and found that 40% of them were undernourished; 86% had dental carries; 90% had adenoids, and 40% had hypertrophied tonsils. This investigator points to a serious fact when he declares that many of the children from these poorer districts no longer possess the desire for good food. Their stomachs are in such a condition that good food will not be retained in them at first. The stomach is so used to tea, coffee, etc., that it has actually to be educated by degrees to a stronger, wholesome diet, much as one might train a muscle! Dr. Sill concludes that it is not poverty primarily that is responsible for malnutrition among children; rather it is ignorance.

The breakfastless child presents a baffling problem to the school authorities who do not provide school lunches, as well as to the teacher. In innumerable cases reported from the larger cities of this Country as well as Europe, the breakfast, provided any is had, consists of such things as bread and tea or coffee, and, in some cases, beer or other alcoholic beverage. Often the father is dead and the mother leaves the home for her work before 6 o'clock, allowing the children to "pick up" their own breakfast. In many cases, the parent does not return to the home before 7 o'clock at night, and then they receive their first real meal of the day. The dangers in such procedure are too obvious to need discussion.

INJURIOUS BEVERAGES AND MALNUTRITION

Another somewhat baffling problem is presented by the child who drinks coffee, tea, beer, wine or other distinctly injurious beverages. A child reports to us thus: "We always drink beer in my home. My father says water is no kind of a drink. The first time I drank beer it made me vomit, and I didn't like it at all. But I have got so now that I like it. I have a glass every night. On Sunday I have a glass of wine." (!) The boy was 10 years of age, a piteous undernourished child. He is but one of a great legion of children in whose homes water is looked askance upon as a slaker of thirst. Exactly how widespread this juvenile wine-bibbing is cannot be discovered accurately. Certain it is, however, that among the foreign element in the tenement districts of our cities it is practically universal.

One does not need to study malnutrition in the foreign children alone, however, to find the baneful effects of habitually taking into the stomach injurious beverages. Perhaps the simplest illustration is to be found in our great juvenile coffee drinkers, who

are by no means the children of the poor or the tenement. It is a universal experience among teachers, who take the pains to do a little investigating on the side, that coffee is a common article in the dietary of school children of all estates, poor and rich alike.

A great many studies have been made of the effects of caffeine and taine. Perhaps the work of Hollingworth at Columbia is best known. In one of his studies (14) he endeavored to determine the influence of caffeine alkaloid upon the quality and amount of sleep of his subjects. The experiment was continued over a period of 40 days. The 16 subjects were given varying doses of caffeine, disguised in such a way that suggestion was absolutely ruled out. A series of control tests were performed simultaneously. Among his conclusions are: (1) small doses of caffeine alkaloid do not disturb sleep, except in individual cases; (2) when the amount of caffeine is increased to 6 grains, sleep was impaired markedly; (3) the evil effects of the drug are greatest when it is administered on successive days so that the results are cumulative; (4) the effects of caffeine vary inversely with the increase of body weight. The latter conclusion of Hollingworth is a well recognized principle of pharmacology, as he points out. The larger individual receives relatively a smaller dose per unit of tissue, and the influence of the drug is correspondingly reduced. This investigator also found the evil effects of the drug to be greatest when taken upon an empty stomach, or without food substance.

The most important of Hollingworth's conclusions for us is the fourth. The body weight of the child being relatively inferior, the toxic effects of the drug are infinitely greater than in the case of the adult. This should be an important lesson for parents who permit and even urge their children to make habitual use of coffee or tea as a beverage. Yet how many school children come to our public schools with two or three cups of coffee and a few slices of bread in their stomachs to give them the needed sustenance and refreshment for the day's work!

Whatever may be the influence of the habitual use of coffee and tea upon the mental or physical abilities of adults, it may be said with confidence that they are positively injurious in their effects upon children. It has been pointed out again and again that children need neither stimulant nor narcotic. This is eminently true. The normal impulse to grow which nature implants in all children needs no artificial stimulus or control to direct it. It is self-regulative so long as the body receives the requisite nurture.

CERTAIN SIGNIFICANT CORRELATIONS

Gastpar (11) by 1908 had demonstrated in Stuttgart the direct correlation between nutrition and resistance to disease. Some 8,000 children, previously grouped according to several grades of nutrition and physical defectiveness, were submitted to thorough nutritional diagnosis and demonstrated remarkably that susceptibility to disease is in regular and direct proportion to the lowering of the standard of nutrition. Thus, those children showing the poorest nutrition revealed 79 defects out of each 100 examined, as opposed to 18 defects out of each 100 of those best nourished. Throughout the series also, the incidence of defects increased regularly with the descent of the children upon the scale of comparative nutrition. In later investigations, Dr. Gastpar continued his observations somewhat extensively, but found no reasons for doubting the conclusions reached earlier. It is a fact now universally recognized among child workers that defective nutrition is the direct forerunner of many diseases and defects, as well as an evidence of the presence in the child of adenoids, overgrown tonsils, etc. It is also true that the child who is suffering from malnutrition is far less able to "throw off" incipient disease, once it has fastened itself upon him, because of his lowered resistance power.

Another important correlation is found in the relationship between the undernourished child and the retarded child. One writer states that malnutrition is from two to three times as common among children mentally retarded as among those pupils who are up to grade. It is a fact unescapable that a common cause back of the repeater and the backward child is hunger, more or less chronic and severe. In other words, the unsatisfactory pupil is often a hungry pupil. The child who comes breakfastless to school, or who goes home at noon time to a dinnerless home, or who yet spends the pennies given him by the parents to keep him from coming home at midday, for pickles or jelly-doughnuts, or candy, is the child who lags behind the class and becomes the chronic repeater, often failing to finish more than the fifth or sixth grade before becoming "of age" from the school point of view. Of 100,000 London school children examined, it was found that 28% of the dull pupils were undernourished. Macmillan and Bodine (quoted by Terman) found that of 2,100 retarded pupils, 54.6% were sufferers from malnutrition. The German investigators, notably Gastpar and Tonzig, have found the percentage of correlation between retardation and malnutri-

tion to run extremely high. In fact, it may yet appear that undreamed-of things may be accomplished in the training of the defective child if only his condition of bodily nutrition can be early brought up to standard.

The following account given by Margaret McMillan (17) of the heedlessness and dullness of the undernourished child is especially good:

"The semi-starved, the underfed and ill-fed never get any real hold of the past, or even of the present. They forget their parents like small children. 'Where is your mother?' I said one day to a tall girl in a train. She looked amazed for an instant, and then said in a dull voice, and without feeling, 'She drowned herself in the dam.' That may have been an extreme case, and for that reason it may serve to show the real nature of forgetfulness in many other less striking cases. In the special drill classrooms and school camps where teachers stand for the first time before elementary school children the process of teaching is complicated at first by the brain-dullness of even well-endowed children. 'Please shut the door, Emily.' Emily takes no notice. 'The door is open: shut it.' A light glimmers in Emily's eyes. 'Shut the door.' At last she hears and obeys gladly. She is not deaf through the ear. She is not disobedient. She is deaf through the brain, and this kind of deafness is the result of want of food and want of stimuli. In that state of dullness millions pass their lives. They are diagnosed as naturally dull, unfit for secondary education."

There is no question but that Miss McMillan is here pointing out a fundamental truth. Who shall say that the dull child, the nervous child, the apathetic, listless, retiring child who gazes at one out of wide, expressionless eyes, often set in a face of stony impassiveness, is not primarily a child who is hungry, chronically hungry? And hungry so habitually as not to realize himself that he is hungry? Surely, if malnutrition is not the only factor in his physical passivity it is nevertheless likely to be a prominent one.

THE TOBACCO HABIT AND MALNUTRITION IN BOYS

It is unescapably true that a common cause of malnutrition in boys is addiction to the tobacco habit. Tibbles (2) in a discussion of the effects of tobacco-using sums up his investigations thus: Tobacco is a poison in every form in which it is compounded. Use, however, inures the individual to its effects. Nicotine, the active principle, is an acrid, oily, volatile liquid of pale amber

color, varying in proportion from 7% or 8% in the case of French tobacco to some 2% in the milder Cuban tobacco. The fact that nicotine is a powerful agent in its action upon nerve tissue is evidenced by many experiments. The active principle in the smoke of a single cigar is sufficiently powerful to produce paralysis, convulsions and death in a frog. A drop of nicotine placed near the beak of a canary will kill it; two drops on the tongue of a terrier dog will cause death in a minute. Two drops on the tongue of a cat resulted in death of the animal within two minutes, and a mastiff dog was destroyed in five minutes by the application in the same manner of 10 drops. This writer states that in all cases of animal experimentation with nicotine which he has personally witnessed, severe convulsions of a tonic character preceded death, and *rigor mortis* set in at once. "In man, death has followed the injudicious application of a *quid* of tobacco to stop the bleeding of a wound; the application of nicotine on the point of a needle to a decayed tooth caused serious collapse, and the use of an infusion of tobacco as an external application in skin diseases, and an injection into the bowels for intestinal obstruction, have caused death."

The most natural and immediate effect of tobacco upon the nerve tissues is seen only in its simplest and most natural form when a person smokes a pipe or a cigar for the first time. Extreme signs of shock or collapse are seen in the confusion of mind, the dizziness, nausea, vomiting, violent trembling of the limbs, faintness, feeble pulse and the cold clammy sweat, all of which symptoms are the usual well-known concomitants. There is no doubt about the initial adverse reception which the neuro-muscular system gives nicotine. As a result of practice, however, the system becomes habituated to periodic administrations of the poison, and the extreme revulsion which is at first made against it no longer appears. Tibbles, in common with most other impartial investigators, finds no inevitable injurious effects upon adults from the moderate use of tobacco. Rather, it appears that tobacco is possessed of a salutary influence upon the tired-out man of affairs which is undeniable. Doubtless this attitude is partly psychological. The fact remains, however, that the moderate use of tobacco, particularly of the milder sort, drawn through a long stem and not inhaled, cannot be demonstrated always to be positively deleterious.

Whatever may be the case with adults, however, the use of tobacco among boys in the midst of the growth impulse is demonstrably and positively injurious. Physiologically, the effect of

tobacco upon the general nervous system ultimately leads to a state of malnutrition and anemia of the brain. The progression is somewhat as follows: the nicotine absorbed into the system paralyzes the inhibitory fibers of the pneumogastric nerve, and an acceleration of heart action results; the sympathetic ganglia are likewise paralyzed, and since the passage of impulses through them is thereby impaired the vaso-motor nerves become paralyzed. Interference with these nerves causes dilation of the arterial system and consequent lowering of the blood pressure, and because the nutrition of the brain is thereby impaired, enfeeblement of memory and concentration of attention result. In much the same way, enfeeblement of the nerves of the ganglionic system, secretion and musculature is induced, and a general condition of bad body nutrition comes to pass.

Tibbles concludes:

"One has only to observe the pale face, the marble brow, the haggard and dwarfed appearance of boys who indulge the habit freely to conclude that cigarette-smoking is decidedly injurious. This is, to some extent, due to the inferior tobacco from which some cigarettes are made; the commonest of tobaccos, frequently chemically treated and mingled with tobacco dust, are rolled in impure papers to make cheap cigarettes. The evil effects of cigarette-smoking are greatly enhanced by inhaling the smoke; that it is really inhaled is proved by the fact that very little smoke is exhaled. The fact that the smoke of a cigarette is not very irritating does not lessen the evil effect of drawing it into the lungs, for by this method the absorption of the poisonous principles is most rapid... Repressive measures are required to stop the practice of cigarette-smoking by children, for it is firmly believed that it prevents growth and renders its devotees ready preys to disease. It not only makes them tired, lazy and irritable, but it lowers their mental capacity and moral tone, makes them stupid, dull and weak, and prone to lying and cheating."

It would be very gratifying if we could accept unconditionally all the evidence for the prosecution presented by Tibbles. Empirical observation inclines one to do so. There is another side to the matter, however, which cannot be altogether ignored. Addiction to tobacco, as Pack (20) points out, may be but one of many factors which are operating in the child of mental and moral sluggishness and obliquity. The very fact that a boy associates with companions and mates who are doubtless smokers like himself may be only indicative of a general low-grade moral and mental code for which other influences than nicotine and pyridine are

partially at least responsible. Dr. Pack, however, endeavored very carefully in his well-known experiment among foot-ball players to segregate the effects of smoking from other factors which might in any way be responsible for the inferiority or superiority of any individual. His statistics were obtained from six great American colleges and universities. Among his conclusions were:

(1) Smokers stand little chance with non-smokers in the "try-outs" for football squads; (2) the lung capacity of smokers is approximately 10% less than that of non-smoking players; and (3) smoking is invariably associated with low scholarship. He finds, however, that the smokers appear in the end to be superior foot-ball men, since before training the non-smoker is much more nearly at his best than the smoker, who needs the training (*i. e.*, the enforced abstinence from tobacco) to enable him to approach his best. The amount of improvement is therefore much more relatively in the smoker under training than in the non-smoker.

Dr. Bush (9) reports a study of the mental effects of nicotine and pyridine upon 15 medical students between the ages of 21 and 32 years, of all degrees of ability and native endowment. A series of 120 carefully devised association tests were employed. Dr. Bush sums up the results of his experiment thus: (1) smoking produced a 10.5% decrease in mental efficiency; (2) smoking was responsible for a 22% loss in the field of imagery; (3) the greatest loss of all sorts occurred from the smoking of cigarettes; (4) nicotine was found to be present in all distillates of the tobaccos tested, but was absent in the smoke. In cigarette smoke, however, traces were found; (5) the principal toxic factor appears to be pyridine, which is present in the smoke of all tobaccos.

In our present state of knowledge, therefore, it appears that there is great variation in the effects produced by tobacco in adults. In general, the smoking habit is usually likely to be associated with other factors which tend also to reduce one's physical or mental, or moral tone, thus making it extremely difficult to impute a definite amount of influence to a definite amount of tobacco using. In the case of boys, however, the conviction is universal, and amply substantiated, that the use of tobacco is thoroughly deleterious to the organism through interfering with normal nutrition, particularly of the brain. Metabolism is further impaired by the toxic substances which are absorbed into the tissues.

CHILDREN'S DIETS

There is as yet no universally accepted standard of diet for children. While there is an increasing literature upon the subject, it appears that thus far variable results have been obtained. Perhaps the most classic of all the investigations is that by Camerer (10), which embodies careful observation of the dietaries of his own children continued over a considerable period. The table is arranged to indicate the total grams of each type of food required in 24 hours, according to age periods.

GIRLS

AGES	2-4	5-7	8-10	11-14
Average weight in kilos.....	12.7	16.6	22.3	31.9
Total grams food.....	1183	1402	1638	1723
Total grams per kilo of weight.....	93.2	84.4	73.5	54.0
Grams protein per kilo.....	3.6	3.0	2.7	2.1
Grams fat per kilo.....	3.0	1.8	1.3	1.3
Grams carbohydrates per kilo.....	9.2	10.9	9.9	8.4

BOYS

AGES	5-6	7-10	11-14
Average weight in kilos.....	18.0	24.0	34.0
Total grams food.....	1517	1699	1909
Total grams per kilo of weight.....	83.7	70.8	56.1
Grams protein per kilo.....	3.5	2.8	2.4
Grams fat per kilo.....	2.5	1.3	1.0
Grams carbohydrates per kilo.....	10.9	10.4	7.7

Among other investigators in this field may be mentioned Hasse (12) whose observations included nutrition in children between the ages of 2 and 11 years; Uffelman (quoted by Hasse), who combined his own investigations among children between 1 year and 6 months and 15 years of age with those of Camerer (10); Steffin (23) and Herbst (13). It is significant that, with the exception of the work of Steffin, the German investigators find a fairly steady and uniform decrease in the number of calories of food needed per kilo of body weight from infancy on. This fact,

as Locke (17) points out, is in accord with Rubner's Law, which states that animal metabolism is directly in proportion as the size of the body surface. According to Rubner, the smaller body of the child radiates a greater amount of heat than the larger body of the older person, thus necessitating the consumption of a greater amount of food relatively to the body content. Kassowitz, however, explains this phenomenon on the grounds of the relative shortness of the reflex arc and the consequent more rapid breaking down of protoplasm. Whichever of these theories be true, the fact remains that the younger the child the greater relatively the amount of metabolism.

Atwater (1) several years ago collected records of 491 separate investigations into the amounts of food and of actual nutrients consumed by people of various classes and occupations both in this country and Europe. From the 491 studies, Atwater selected 338 as sufficiently accurate and painstaking to be dependable in basing inferences. As a result of collating and evaluating these numerous investigations, one noteworthy inference was that as a people we in this country eat relatively too little protein and too much fat, starch and sugar; thus our dietary is deficient in the materials which make bone and muscle and relatively surfeited with the fuel elements. Partly this is due to our enormous consumption of sugar, partly to our use of such large quantities of fat meats. In the 338 dietaries examined, Atwater found the amount of fat in European dietaries ranging from one to five ounces a day, over against a range between 4 to 16 ounces in America. In carbohydrates, the European diets varied between 9 and 24 ounces, the American between 24 and 60. Even more remarkable than the lack of proper balance between the ingredients, however, was the gross *per capita* average of food actually consumed in America as against that consumed in Europe by people engaged in similar occupations. Voit's classic standard for a laboring man at moderate work allows 3,055 calories of energy, and for a man doing "severe" work, 3,370 calories of energy. Examination of dietaries of Massachusetts and Connecticut factory operatives, day laborers and mechanics, revealed that among those doing moderate work 4,500 calories were being supplied; while among those doing "severe" work, the number of calories varied between 5,000 and 7,800, rising in one case as high as 8,500!

How, asks Atwater, are we to explain this great divergence between European and American dietary standards? It is surely not difference in climate, nor can our rather more strenuous life

of muscular exercise account for it. "In the German army, where especial attention is given to diet and where it has been an axiom ever since the time of Frederick the Great that soldiers to march well and fight well must be well fed, a ration for times of peace has been computed at 2,800 calories, and one for time of war at 3,095 calories. During the Franco-Prussian War, shortly before the battle of Sedan, an order was issued by King, afterwards Emperor, William, which provided an extraordinary war ration, which is estimated at 3,985 calories. If a man under tremendous physical and nervous tension... is well supplied by a ration of less than 4,000 calories of energy, and German professional men in their quiet but active and successful work at home are amply nourished with 2,700 calories and less, how happens it that men of mental rather than muscular occupation in America consume food with 4,000 calories and more? The answer to this question is found in the conditions in which we live. Food is plenty. Holding to a tradition which had its origin where food was less abundant, that the natural instinct is the measure of what we should eat, we follow the dictates of the palate. Living in the midst of abundance, our diet has not been regulated by the restraints which obtain with the great majority of the people of the Old World, where food is dear and incomes are small. Indeed, the very progress which we are making with our civilization brings with it increased temptation to overeating. The four quarters of the earth are ransacked to supply us with the things which will most tempt our appetites, and the utmost efforts of cooks and housewives are used in the same direction."

EXCESS OF CARBOHYDRATES IN CHILDREN'S DIETARIES

Dr. John Aulde, of Philadelphia, (3) calls attention to the common practice prevalent among children of taking excessive amounts of carbohydrate foods to the exclusion of the necessary proteins and fats which their system needs. This sort of diet, rich in sugars and starches, leads to fermentation and decomposition along the intestinal tract, with the concomitant headache, lack of vigorous appetite and various forms of indisposition. During the night the poisons formed in the intestinal tract are "sucked" up by the lacteals and are carried in solution by way of the thoracic duct into the general circulation, and the child wakes up dull, morose, inattentive and depressed. The demand of the body for mineral salts comes about directly as the chemical reaction of the system to the excess of acidity which diminishes the alkalinity of

the blood and thus lessens its oxygen-carrying capacity. Nature reacts against this superabundance of acid and putrefactive toxin by drawing off nitrogen in the form of ammonia from all available body fluids and tissues. Evidence of this complementary action is seen in the increased excretion from the kidneys of ammonia during attacks of indigestion. In the case of diabetic coma, this output of the nitrogenous element, ammonia, in the urine is often six times the normal amount.

To quote from Dr. Aulde:

"Suppose for instance that we have a child suffering from intestinal indigestion; and then suppose again that the effect of this indigestion is to deplete the lime content of the brain as well as the muscle. Would it not follow that we should have a derangement of mentality and a physical debility characterized by loss of muscular stability? Add to this the loss of lime from the bones which would naturally follow, and we have a substantial basis to account for 'softening' of the bones, bow-legs, rickets, hydrocephalus, failure in nutrition, and necessarily intestinal indigestion, with a tendency or susceptibility to acute infections, such as diphtheria, typhoid fever, influenza and the like... As a result of an unsuitable dietary, school children as well as adults suffer constantly from intestinal fermentation and decomposition, and I have seen numerous cases of this class where treatment for anemia had been conducted for months without apparent benefit. Still, they responded immediately to the administration of suitable lime salts, carbonate, phosphate and sulphate... These differences enable us to account for the peculiar dietary demands of children suffering from calcium depletion and the consecutive nervous manifestations. They dislike oatmeal, hominy, cornmeal, rice, graham bread and flaked-wheat breakfast foods and honey, but crave eggs, butter, milk and syrup because of the excess of lime. Indeed, the salvation of the child depends upon the lime content of the milk supply, a clinical and scientific fact, susceptible of demonstration under the most forbidding circumstances, such as mental deficiency and backwardness, chorea, epilepsy, mucous catarrh and skin diseases and bed-wetting. Especially valuable is lime in the treatment of all intestinal disorders, cholera morbus, cholera infantum, diarrhoea and dysentery, etc."

Dr. Kellogg (15), discussing this same evil of excess of carbohydrates in the diet of children, takes occasion to tilt at the great amount of candy and sweets consumed by the average child, reminding us that the daily per capita consumption of cane sugar among Americans is 1/5 pound. Brandl, in experiments on a dog,

showed that the administering of even as weak solution of cane sugar as 6% caused much irritation and reddening of the gastric mucous membrane, and that when the strength of the solution was increased to 20% the dog manifested symptoms of great distress. Mosso showed that cane sugar, taken in considerable quantities, lessened materially the capacity for work in both men and animals. The same writer quotes the physiologic chemist Bunge as having stated some years ago that cane sugar is responsible for the increasing proportion of pale faces, bad teeth and general malnutrition so prevalent among school children. Kellogg also calls attention to the fact that the appetite for sweets is normal and natural and worthy of gratification, provided the sweets of fruits such as raisins and figs, and the juice of oranges, prunes, melons, etc., be substituted for the insidious cane sugars. Fruit sweets furnish the natural blending of lime salts needed by the body.

This writer also cites the evils of excess proteins in the dietary of children. The ancient theory that flesh is a nerve and muscle food which is indispensable still survives in the minds of many people, and unfortunately of those who should know better. Children coming from well-to-do families are often the offenders in this connection. Any excess of protein beyond the actual amount needed must be metabolised and excreted along with other wastes, thus placing added burdens upon the organs involved in the oxidation of protein. This results in the formation of toxins in the intestines from the portions of unassimilated or undigested food, in much the same way that fermentation follows an excess of carbohydrates. Metchnikoff and others have shown clearly the injurious character of such toxins from excess protein. Headache, dullness and functional inefficiency are concomitants of the constipation which these toxemias in the colon set up. Kellogg makes this in large measure responsible for the inefficiency of school children as well as brain workers generally.

Dame Nature, as has been often pointed out, always beneficent in her nurture, has a lesson for parents here. Analysis shows that mothers' milk contains not more than 1.5% albumin, which is not more than half the amount contained in cow's milk and considerably less than that found in the milk of most mammals. This in itself is an evidence that the child does not require a high degree of nitrogenous food, or protein, to keep in good condition. It is a fact now well and frequently demonstrated that breast-nursed children are far ahead of children fed upon artificial foods at

every stage of infancy, usually doubling their weight within the first ten to eleven months.

Tibbles (26) makes a poorly regulated dietary, especially one in which there is a superabundance of sweets, the most probable cause of the so-called night-terror (*pavor nocturnus*) which frequently is met with in children of any age up to ten or twelve. The attack causes the child to awaken suddenly out of a sound sleep with a shriek of mortal terror. His face is extremely pale or flushed, a cold perspiration breaks over him, he clings wildly to the nurse, but cannot for some minutes be comforted. After coming to himself, for undoubtedly he is delirious during the attack, he is quite at a loss to explain the cause of his fright. The probabilities are that he has been the victim of some bad dream or nightmare, traceable to unsuitable food which has failed to be properly assimilated. It is the opinion of this writer that the toxic effects of a superabundance of carbohydrates, especially sweets, are in many if not most cases sufficient to account for attacks of this terror.

SYMPTOMS OF UNDERNOURISHMENT

Moderately severe cases of undernourishment in children are easily discernible even to the casual or lay observer. The less extreme cases are, however, often unappreciated without special examination of the suspected child. Wimmenauer (29) has pointed out this fact very clearly in his work among the Mannheim children. He concludes that no accurate judgment of the state of nutrition of a child can be based either upon the method of casual observation or upon that of the height-weight scale. He insists that the condition of the child's skin, particularly in the region of the chest, is absolutely the only infallible guide for the medical inspector. According to Wimmenauer the condition of the cellular tissue of the dermis and of the fatty cushion beneath must be ascertained. The region between the fifth and eighth ribs is the most satisfactory part of the body for this examination, particularly since there the dermis lies very close to the skeletal structure and the fatty tissue between the ribs can be best observed. If the skin feels soft and moist, yet firm, to the touch, he regards the state of nutrition of the child to be good; if, however, it is dry, hard and rough he considers the child to be suffering from some degree of malnutrition. If the fatty tissue between the ribs is such that the bones when viewed from above do not show, that is regarded as excellent nutrition; if the bones

below the nipples only are visible, the state of nutrition is deemed to be medium; if deep furrows are to be seen, the condition of nutrition is set down as poor.

Wimmenauer finds this method to be a very satisfactory one in determining the condition of nutrition in the school children of Mannheim. He does not reject the supplementary use of the scale of height and weight, however, but regards reference to it as a means of control in checking up results from his own method. Kerr (16) and others have shown how difficult it is to standardize a scale which will be applicable to all children. Kerr concludes: "The various indices that have been recommended by many writers are only satisfactory in a rough way for mass measurements. They can never replace individual judgment in a single case, and are simply empirical statements of averages," which is very true. Hence the need for the control method of Wimmerer, as well as of much individual observation.

Terman (25) sums up well the external and more obvious symptoms of the undernourished child thus: "In malnutrition the face is not usually thin, but often plump in appearance, and for this reason many cases are overlooked. In such cases the fat lacks firmness and is not healthy. Often there is a fullness under the eyes. The color is usually, but not invariably, pale. The skin is likely to be harsh and inelastic, the hair deficient in lustre, and the eyes dull or 'nervous,' with pale blue rings beneath. The breath may be foul, with other symptoms of indigestion. Motor symptoms are common, especially twitchings of the eyelids and tongue, unsteadiness of body balance, as shown by Warner's simple tests; and in extreme cases movements approaching the choreiform may be marked. Stuttering may develop. The child usually plays less actively than the average, fatigues easily and sleeps badly. Nightmares, groundless fears and obsessions are common. The child may be either apathetic and listless or else abnormally high-strung and irritable. Children of the latter type are easily worried by school work and develop finical habits. The appetite is nearly always diminished and is likely to become freaky. Queer food preferences and violent aversions are formed. The best foods are likely to be just the ones most disliked. If the parents are unwisely indulgent the child becomes spoiled."

Dr. Terman is here pointing out undoubtedly a fundamental fact. It is not only the child of poor, working parents who comes to school improperly fed. The school also contains a liberal sprinkling of children who because of some strange finicky notion either do not eat any breakfast at all, or else eat the most im-

proper foods from violent preference. This does not imply that children should be forced to take foods for which they have aversion. It does mean, however, that parents, originally guilty in failing to arrange suitable dietaries for their children, are reprehensible in permitting them to take their food preference entirely into their own hands, often to the extent of suffering them to go breakfastless to school. "What sort of breakfast had you?" we asked a 12-year old girl, who was obviously undernourished. She was habitually dull and lifeless. "If only I could put a bomb under her and wake her up!" exclaimed the teacher. "Nothing!" she replied. "I never eat any breakfast. I am never hungry in the morning." (!) Healthy, normal childhood, there!

It is, perhaps, unnecessary to call attention to the fact that an unsuitable dietary is not the only possible factor in causing a child to be undernourished. There are a score of other possible factors any or all of which may be found to be co-operating in reducing the nutritional condition of the pupil. Some of the more usual of these are over-stimulation; improper habits and conditions of sleep; insufficient clothing to permit the heat regulating mechanism to work in a normal manner; bad teeth or gums; toxæmia resulting from adenoids and overgrown tonsils; eye strain; lack of proper play and exercise; etc., etc. In all of these, however, it is questionable whether there is not an underlying condition of poor nutrition which aggravates and is in turn aggravated by them. In brief, it is probable that any condition in the environment of the child which does not provide for normal reaction to normal stimulus has a very direct and profound effect upon the nutritional state of the organism. There is room here for much investigation.

PRACTICAL CONCLUSIONS

Some of the chief facts to be taken into consideration concerning malnutrition as a factor in efficient school work are:

1. Full, complete and sufficient nourishment is a prime condition in normal functioning of the cells. Body nurture is ultimately but the nurture of the cells. Optimum metabolism means optimum body response.

2. Disastrous as is a failure of complete nutrition to the welfare of the adult organism, in the case of the child any interference with proper nutrition is triply disastrous. In the midst of the growth impulse, the maintenance of the integrity and vigor of the cells is a prerequisite to normal development. The organ-

ism of the child is after all but an animal whose growth depends wholly upon nurture. Limit, stint or unbalance in this nurture will result inevitably in retarding, checking or perverting growth.

3. Various statistics have been worked out by a great number of investigators in this field, both in America and Europe, concerning the actual percentage of undernourished children among the school population. It is probable that at least 10% of the school children of America are seriously undernourished; while probably another 10% are in mediocre physical and mental condition because of defective dietary. In many localities, particularly among the foreign and poorer classes of the large cities, the percentage of undernourished children may rise well beyond 25%. Estimates run as high as 59%.

4. There appears to be a positive and direct correlation between the condition of a pupil's nutrition and his susceptibility to disease. It also appears that the undernourished child has far less strength to throw off diseases once they have fixed themselves upon him.

5. Malnutrition is one of the most common and usual causes underlying retardation in children. In probably half the cases, the behind-grade pupil is the poorly fed pupil. Available statistics seem to point to the fact that immediately subsequent to the inauguration of a program of school feeding the mental ability and alertness of the pupils who previously were of a poor grade of scholarship increase sharply. The breakfastless child and the child coming to school from homes where there is little or no intelligent oversight of the children's food eaten present social problems of no little moment to the school authorities.

6. For obvious reasons there is no universally accepted dietary for children. The child requires a greater amount of food relatively to his body content than does the adult, owing to the greater metabolism in the smaller body. Several investigators have worked out careful tables indicating proper dietaries for children of various ages. Since race, climate and other conditions are factors, however, it is evident that no table can meet all requirements.

7. As a people, we Americans undoubtedly consume too great amounts of carbohydrate foods; and it follows naturally that American children suffer from a similar excess of sugars. The inordinate consumption of candy among children is an illustration in point. An excess of carbohydrates taken into the food-tube results in the drawing off of nitrogen from the fluids and tissues in order to neutralize the superabundance of acids and

putrefactive toxins thus formed. This diminution of the nitrogenous matter within the organism may manifest itself in a variety of ways, such, for example as in a decrease of alkalinity of the blood, with consequent lessening of its oxygen-carrying capacity, defective brain nutrition, depletion of muscular energy and diminution of lime in the bone tissues. If the condition of what may be termed "carbohydrate poisoning" is long continued, the whole functional and, to some extent, structural aspects of the organism may be seriously compromised.

8. Children crave sweets once they have tasted them. This seems not to be an abnormal thing, for primitive man must have found the sweets of fruits and berries delicious and satisfying. Obviously, the sweets of fruit juices should be largely relied upon to furnish this element in the child's diet for which he naturally craves and which meets a distinct requirement of his body. In addition to deriving from fruit juices the sugar which is so pleasant and valuable, the consumer of these foods finds in them a perfect blending of lime salts which are almost ideal foods. Especially valuable are raisins, figs, dates, oranges, prunes, peaches, plums, apples, pineapples and all kinds of melons. A child brought up on sweets such as these, with little cane sugars such as candies, will thrive far better than his playfellow whose diet includes an abundance of candy and cane-sugar sweets.

9. The condition of a pupil's nutrition cannot always be calculated from a mere cursory examination of his face. Any system of medical inspection which relies upon casual observation to detect the undernourished pupils is little better than a farce. What is necessary is a complete physical examination, with special reference to height, weight, condition of epithelial and fatty tissues, etc., etc. Careful individual study is essential.

10. There is much evidence to show that the effect of tobacco upon the adult organism is deleterious. There is evidence also that its influence upon some users is at least not harmful. Whatever may be the facts in the matter, however, there is no question about its positively evil effects upon the growing body of the boy. Evidence is only too positive that, aside from the bad company and questionable moral associations of its juvenile users, nicotine and pyridine act as positive poisons upon the body which is in the midst of the development impulsion. Its use is correlated also, directly or indirectly, with poor school work.

11. What shall constitute the proper dietary of the child is one of the greatest problems of the home. Proper feeding is as important a factor in development as is proper clothing, proper

environment, or any other condition. Perhaps the two rules of Atwater are as sane as any by which to be guided. They are: (1) "Choose the foods that agree with children, and avoid those which they cannot digest and assimilate without burden;" and (2) "use such sorts and quantities of foods as will supply the kinds and amounts of nutrients needed by the body, and yet avoid burdening it with superfluous material to be disposed of at the cost of health and strength." The first of these is in accord with the experimental studies of Pavloff and others, which indicate that an actual liking for a particular food stimulates the flow of the gastric juices, thus aiding digestion before the food is even introduced into the system.

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THE HYGIENE OF HAPPINESS IN EDUCATION

BY ELIZABETH HAMILTON-MUNCIE AND FLORENCE KEITH-HYDE

(NOTE: The following contribution contains much that is suggestive and stimulating. It breathes now the classic philosophy of Socrates, now the ardor of Rousseau. At the same time it is the heart and soul of Pestalozzianism. Across it there runs an unmistakable woof-thread of truth that challenges our thinking. In studying it one is conscious that much yet remains to be done in the field of education before the educational millennium can dawn. While realizing that beginnings have been made more or less sporadically along the lines suggested, one wonders how universally practical such a program of education is capable of becoming.—ED.)

Constructive prevention of all bad social conditions is of course a process of education, whose real purpose is to fit for life. In other words, the aim of education is to produce men and women with sound minds and sound bodies, who know their powers of adaptation and creation and can use these in adjusting to their environment, or bettering it according to the ever growing needs of their inner selves and others. Such adjustment and betterment is the only source of real happiness that humanity knows.

That "the pursuit of happiness" is a human right was recognized and immortalized by our forefathers. That the lack of happiness can interfere with physical, mental, moral and spiritual health is a matter of common knowledge and observation. Any system of education, therefore, which does not secure that happiness which is indispensable to health will fail again to accomplish its purpose.

But education cannot secure this indispensable happiness unless it frees the spirit as well as the body and the mind from all unnecessary limitations. Lincoln voiced the only sound spiritual attitude when he said, "I am not so much concerned to have God on my side as to try to put myself on God's side." This is the yearning hidden deep under the most selfish pleasures of adult life, and also expressed in the unconscious desire of every child for approval.

That education has not yet freed even the body or mind from unnecessary limitations is now only too evident. We are even coming to see that neither body nor mind can be free until the individual has gained in some measure this peace of the spirit. How are we to start childhood on the right path? Have we listened to our students of child life? Have we put their knowledge to use wholeheartedly and systematically? If, as they say, the child craves opportunities for self activities of body, mind, and spirit, and we agree that these cravings are normal, it should be the province of education to PROVIDE THESE OPPORTUNITIES IN RIGHT DIRECTIONS BEFORE THE CHILD FINDS OPPORTUNITIES IN WRONG DIRECTIONS.

The fact that the largest percent of all criminals ranges from sixteen to twenty-five years of age proves that the impulses of adolescence often seek outlets in crime. It cannot be doubted that they are under a delusion that thus they will get real happiness. Statistics show that no criminal leaves his "specialty." Once a pickpocket, always a pickpocket. The "specialty" in each case seems to fit some natural gift. Aside from the gain, there is a fascination in the skill required that urges him on to become an adept,—a real pride as of a master workman. If the special activity chosen preys upon society instead of serving it, the community and not the criminal has had the power to prevent.

For all failure to prevent the young from starting criminal activities, only ignorance of causative factors is to blame. Made wiser by the war, and alrerady rich in a knowledge of child psychology furnished by experts, let us reconstruct our system of education, in imagination at least,* basing our methods on two great principles,—THE THREEFOLD NATURE OF THE CHILD and HIS NEED OF OPPORTUNITIES FOR SELF ACTIVITIES PHYSICALLY, MENTALLY AND SPIRITUALLY.

But before building anew, we will be sure we have a firm grasp on the lessons of the war.

Whatever the religious belief of soldiers or "ministers," they found on the battlefield but one Great Animating Presence to whom their inner consciousness bore unmistakable witness, and through whose inspiration they were consciously able to transcend human powers, as indeed have all souls from the beginning

*While this article is going to press the National Education Association will be meeting in Chicago. If the ideas advanced here should also be advocated there, as would seem almost inevitable, the authors will feel that many minds have reached similar conclusions independently, and are ready for efficient co-operation in the near future.

of time whenever their natural spirit was possessed by the Spirit of God. Many a young father, returning from a vision-filled battlefield, will look earnestly to the spiritual unfoldment of his children. Shall we be able to satisfy him?

In a certain ward in a hospital in New York, lie some human wrecks called "basket soldiers." Their limbs are gone. By marvels of surgery they live. It is said that only one, called "Laughing Charlie," ever smiles. With unlighted faces they are looking in grim endurance down a dark future. Who has the spiritual vision to see a use for them in the world's work that shall lift them above the need of hands and feet?

The great secret of the phenomenal success of the American system by which the army was transformed by instruction in physical, mental, and moral hygiene, was that THE WHOLE MAN WAS APPEALED TO. His spirit was aroused through his sense of honor, his love for his dear ones at home, his sense of fair play, and a knowledge of his responsibility for the success or failure of the struggle against evils which the Germans personified. Not only did his reason recognize the relation between clean bodies, clean minds, and fighting efficiency, but he was inspired with a dominant spirit of self sacrifice that fired his imagination, steeled his will to voluntary self control, and launched him an invincible superman against a hitherto victorious foe.*

Has peace no way of appealing to THE WHOLE CHILD? No motive to offer youth for mental, moral, and physical self control? Are church, home, and school together powerless to rouse the rank and file to that self surrender that makes one gloriously and radiantly alive with the sense of an infinite energy flowing through one's whole being? Can only the horrors of war, the presence of death, and the grim silences of the trenches accomplish this result for the many?

If so, what can be done for the boys too young to go to war? Big brother cannot pass on to little brother the right to wear his medals, nor can he hand down his spiritual development. Now with the war over, how is little brother to find himself and to acquire that self control that underlies all clean living and clean thinking?

*The President's address in Boston, February 24, is just at hand. These words are pertinent. "Men have testified to me in Europe that our men were possessed by something that they could only call a religious fervor. They were not like any of the other soldiers. They had a vision, they had a dream, and they were fighting in the dream. And fighting in the dream, they turned the whole tide of battle, and it never came back."

We will face the issue. What did war give our boys that peace had lacked? An intimate sense of God. We had expected to build manhood without that. And yet we knew that "the only safe platform on which a nation can stand is the platform that is Christian."* "Broad minds, intelligence, culture, are not enough." Boys now returning from France say, and they whisper it, "We have seen the Christ." Christianity without Christ is mockery. How can education bring to our youth the real significance of the risen Christ that He may become a vital force in their lives? The late Theodore Roosevelt, in concluding a message to the troops in France, sent June 5, 1917, wrote:—

" 'Walk humbly.' You will do this if you study the life and teachings of the Saviour."

There is but one solution. We have been trusting in our finite wisdom in matters of education. Let us add to our war lessons, a course also in the laboratory of Nature and discover some of her laws of development. Perhaps then we shall be able humbly to co-operate with her in developing human nature. For we refuse to believe that the stress of war, although it revealed unguessed possibilities of heroism—and our system of education has been unable to bring out such heroes as it should,—we absolutely refuse to believe that the stress of war is necessary to stir our youth to their highest nobility.

Luther Burbank, twelve years ago, gave us the results of a long course in Nature's laboratory where he had created unthought of beauty in the world of flowers, for the comfort and enjoyment of human beings. He earnestly asserts that the flowering of "human plants" depends on the same "earnest scientific investigation of the fundamental principles of education" to "find the causes that produce sane, well-balanced characters able to use their inborn energies for securing happiness for themselves and others."** If this is true, A HEALTHY BABY WITH RIGHT ENVIRONMENT AND RIGHT OPPORTUNITIES FOR UNFOLDING HIMSELF ACCORDING TO THE LAWS OF HIS OWN NATURE OUGHT AS INEVITABLY TO GROW INTO A RIGHT MINDED, SELF-CONTROLLED SOCIAL BEING, GIVING AND FINDING HAPPINESS, AS A SOUND SEED, UNDER THE SAME CONDITIONS OF ENVIRONMENT AND OPPORTUNITY INVARIABLY PRODUCES A PERFECT FLOWER, FITTED FOR SUCCESSFUL LIFE IN ITS OWN SPHERE AND GIVING HAPPINESS BY ITS BEAUTY AND FRAGRANCE.

*The Need of Christian Leadership. Rev. Charles Sheldon, D.D., in "The Light" for March-April, 1919.

**Results of plant study and culture, applied to education in "The Training of the Human Plant," by Luther Burbank. The Century Co., New York.

To our two great principles already adopted for our reconstruction of education, we can add some promising methods. For whether human plant or flower, the principle of growth seems to be the same—obedience to laws within the seed; and the purpose also—happiness for health's sake to result in giving happiness. Therefore it is wise to attempt the same method by providing an environment that will supply all the needs of growth and leave the child free to take, assimilate and use, according to his instincts and intuitions.

This kind of education WILL NOT PLACE GREATER BURDEN UPON THE ALREADY OVERWORKED MOTHER. NOR WILL IT TAKE HER RESPONSIBILITY OR TRUE WORK FROM HER. But it will need for any measure of success her confidence and her co-operation, and in return will help fit her task to her strength.

The new view of a child as a growing plant and new knowledge that IT WAS IN THE GAPS BETWEEN HOME AND SCHOOL AND CHURCH THAT OPPORTUNITIES CAME FOR THE WRONG DIRECTION OF CREATIVE ACTIVITIES, both lead us to the same conclusion that every moment brings its need for growth, and for supervision. Any new system also must come into being as a growth, shaping itself by a natural process to meet an intelligent demand from enlightened mothers for instruction and co-operation. Each community working out its own details of administration would tend to form a Co-operative Home-Community-School System, suited to its own peculiar needs and type of life.

Since all systems, however, will be based on the same fundamental needs of childhood, there will be, of course, a similarity of methods. It is with these fundamental methods that we can deal now with a clear vision. The most enlightened teachers in whom the parents have confidence will naturally become the "gardeners" for these human plants in the school. The parents themselves will be the "home gardeners;*" and there will be "community gardeners," or trained experts, to care for group activities outside of school hours and to give special spiritual and medical aid. Thus to the present spiritual adviser and medical adviser will be added an expert mother's adviser in the trained leader of leisure time activities.

It will be the function of the school to advise the home where its responsibility begins and ends, what the legitimate needs of the child are and what equipment should be provided to satisfy

*The authors' attention has been called to the fact that Froebel's original idea was the home garden.

these needs. Almost all the problems today of the unruly child, the backward child, and the "bad" child are coming to be recognized as due to repression of normal instincts for self creative activity either by physical abnormalities or by an unfit or limited environment.*

Then the school will foster the formation of natural play groups, train the leaders and suggest the equipment and activities. Any kind of community service that is legitimate from children can and should be included in play activities. Joseph Lee says, "To the child play is life and growth itself." This implies that right types of play are constructive.

If our ideal is to produce men and women of vision, the first essential is to have nothing but leaders of vision, men and women of sound faith and conviction. Burbank says, "Child life in the first ten years is the most sensitive thing in the world.—The child reads your motives.—The child is the purest, truest thing in the world."

We have said the purpose of education included the production of sound minds and sound bodies. Have we always taken care to start with a sound body? Would anyone knowingly plant a seed that was not sound? And yet many physical and mental troubles of adult life are traceable to uncorrected physical causes in childhood. Some of these causes are now receiving intelligent attention—such for example as adenoids, enlarged tonsils, decayed teeth, and eye-strain. But there is a form of surgery as yet little recognized by the general public, to which some of the most enlightened judges are now recommending cases of mental and moral delinquents and sex perverts before committing them to reform or

*Since this article was written, pamphlets from the Department of the Interior (issued by the Bureau of Education for Mrs. John Dickinson Sherman, recently appointed by Secretary Lane as Special Assistant Director of the United States School Garden Army to work with women's organizations) have been received urging the co-operation of women's clubs in making a success of this Garden Army by having 5,000,000 children enrolled and instructed in time for planting next Spring. 1,500,000 were enrolled last year.

Here the grouping is by parental initiative and school supervision. The garden instructors are now being trained and schools are asked to bear the expense of their salaries. The publication "School Life," issued twice a month by the Bureau of Education, says, in the number for Oct. 1st., "The value of this work in education, physical, mental and moral is greater than the value of the food produced.—It gives strength of muscle, steadiness of nerve, a clear eye and strength to endure. It teaches morality. It gives those experiences which have always contributed much to character."

Thus already the government is instrumental in creating an organization whose expansion for educational activities could easily make the imaginary Home-Community-School System a reality.

special schools. And with remarkable results. It is now possible for all physicians to gain this advanced knowledge.* Not only by circumcision which is needed by a large percent of girls and most boys, but "by the surgical removal of all points of irritation from the pelvic organs, many liars have been made truthful; thieves, honest; the insane, sane; and the sensual, virtuous." This is called orificial or constructive surgery because it has to do with the organs of generation, or the lower orifices of the body, where abnormalities occur as frequently as at the upper orifices. But the results of the latter are not to be compared with the disturbances which the former produce upon boy or girl, man or woman. "From the physical irritation of the sexual organs any degree of emotional, moral, or physical ills may arise.—Until wrong physical conditions are corrected, our moralizing and exhorting are but 'sounding brass and tinkling cymbal.' May prudery and false notions no longer prevent the thorough understanding of these conditions."***

To know their powers of adaptation and creation and to use them in adjusting to their environment or bettering it according to the ever growing needs of their inner selves and others—this necessitates the organization and supervision of leisure time activities, because it involves a child's activities all the time and an adult knowledge of them. If, moreover, the supervision does not intrude, if the organization is a simple natural grouping of neighborhood children, not too many in one group, and if every type of activity is made possible in a form suited to each age in an atmosphere of spontaneous play, children will unconsciously reveal their powers of creation, will learn adaptation to materials at hand, and will free their threefold natures for complete self expression and for receptivity to only normal impressions.

Before a child is of school age an almost indelible foundation is laid for life habits. These need no longer be left to chance or ignorance, but may be acquired unconsciously and inevitably.

Previous to school age there is now a great national waste and a stunting of child life. Certain interests, at their height from the ages two to six, tend to wane between six and ten, and yet are needed then to save memory work from becoming irksome. MANY

*Correspondence School of Constructive Surgery, Des Moines, Iowa.
Journal of Orificial Surgery, Chicago, Ill.

Text book of Orificial Surgery. Pub. by Journal.

**Physical and Psychical Causes of Sexual Immorality. A reprint from The American Journal of Clinical Research. Muncie-Hyde Publishing Co.

The Need of Orificial Surgery for the School Child. Correspondence School of Constructive Surgery. Des Moines, Iowa.

CHILDREN ARE CONSIDERED BACKWARD WHO ARE SIMPLY NOT INTERESTED. Clever adaptation of much of this foundation work to the ages preceding six has already proved successful where tried,* and could easily be accomplished for the many in play groups.

During school age, school hours could be saved for rapid advance by delegating much needed drill and repetition to play hours in the form of delightful games.

If play groups served merely to reveal a child's powers of creation, they would be worth all they cost in their vocational guidance of later education. It can be easily discovered what any normal child's general types of natural gifts are before he is ten years old.

Cases of subnormal development can be detected by games such as are used at psychopathic hospitals, and without the child's knowledge.

CONCLUSIONS

It seems plainly evident that play groups of the right type, properly supervised and equipped, are A VOCATIONAL, ECONOMIC AND HYGIENIC NECESSITY both to the efficiency of the school which they supplement, and to the development of the child.

The school itself will be ready to receive the child that he may be transplanted without shock. Here periods for mental concentration will be short at first, alternating with physical activity to keep the mind alert and receptive. Open window rooms, summer and winter, will keep the blood oxygenized; and the frequent, though brief moments of activity will keep the circulation active. Any lack of interest on the part of the child will become a subject for individual study, without the child's knowledge, for physical, mental, or spiritual causes and their adjustment. A rest room, with hospital equipment, will be included in each school plant.

Programs will be laid out on a plan so flexible that EACH CHILD CAN DEVELOP AT HIS OWN PACE, much as a plant regards the growth of no other. (This has been well illustrated by the Gary schools.) Wise minds, acute in fitting tools and materials to childish hands and minds will provide WHAT A CHILD NEEDS, WHEN HE NEEDS IT, and IN THE WAY HE NEEDS IT. And most of all, nothing will be presented at first in an abstract form, but by actual measurement or manipulation of the things in question. Minds will be

*Mrs. Winifred Sackville Stoner's experiments with her daughter. Pittsburgh, Penn., and others.

led from concrete to abstract, especially in mathematics, as is now generally being done in the best schools. Interest will be held naturally by a happy sense of accomplishment.

The child of the future will be considered educated only when he has unfolded, at least partly, all the powers he seems to have, and is fitted for a life work in line with his natural gifts. It is not too much to expect the commercial world and the school to co-operate until the youth is successfully started. Much of the money now used for reform schools, reformatories and jails can then be turned over to the department of education and to the community play groups.

Of the many special problems to be solved by the Co-operative Home-Community-School System, five stand out prominently: (1) Development of the child's spirit power, and its direction so as to energize his whole being; (2) how to make religion a living reality to him; (3) how to teach him obedience without suggestion of fear or force; (4) how to satisfy his craving for real life by emotional experiences that shall build the will-to-do-right; and (5) how to present to him facts of life that everyone must know in such ways as to feed the little child's natural hunger for these truths, so that his spirit may be ready for the great new uplift "when sexual awakening arrives normally and naturally. Then we have the unfolding of Nature's greatest work. This period, holding within itself THE WONDERS OF LIFE AND THE PROPHECIES OF THE SOUL is called pubescence, and is the dawning of the second life—the ethical, the altruistic, the spiritual—as well as a crisis in the physical. We will never have a scientific, wise, helpful school system nor a healthy, sane community, governed by a healthy, sound, sane system of ethics, until this period is understood and regarded with respect and reverence."

The great call to educators today is to live so near to truth that we may take our places beside the little ones intrusted to our care in the great school of life. As Henry VanDyke says, "Teaching is but another form of learning." The child himself, by his helpless dependence on us, is our greatest teacher. His health and happiness are our best test of efficient school hygiene.

TWELVE PROPOSITIONS FOR RECONSTRUCTION OF EDUCATION

1. Development of the child from within through self-activities chosen by instinct from all types of opportunities provided in his environment.

2. Recognition of the relation of sound physical and mental health to spiritual development.
3. Discovery before the age of ten of the general direction of a child's natural gifts.
4. Co-operation of home, community and school in a definite educational organization.
5. Establishment of small co-operative neighborhood groups of children for all kinds of activity with expert leaders, as a vocational, economic, and hygienic necessity.
6. Correction in childhood of all physical abnormalities of both lower and upper orifices of the body, as a basis for sound mental and spiritual unfoldment.
7. Treatment by Constructive (Orificial) Surgery for all delinquents, sex perverts, and mentally deficient before commitment to reform or special schools.
8. Training of mothers for sex instruction in the home through stories suited to the child's age and nature.
9. Abolition of fear or force as a means of discipline, and substitution of parents' judgment for parents' will.
10. Creation of moral fiber by systematic, constructive use, through pantomimes, of the child's natural dramatic impulse.
11. Constructive use of interests and activities between ages two to six, for foundations in memory work.
12. Non-intrusive adult supervision of all leisure time of children.

PUBLICATIONS RECEIVED

PERSONAL HYGIENE AND HOME NURSING. By Louisa C. Lippitt, R. N., Assistant Professor of Corrective Exercises, University of Wisconsin, etc., etc. Yonkers, World Book Company, 1919. 256 pp. ill. In *New World Science Series*.

The sub-title explains the purpose of the book as "a practical text for girls and women for home and school use." There are thirty-one short chapters, including sections on bathing, clothing, hygiene of the menses, colds, posture, general home nursing, bed making, bathing a sick person in bed, communicable diseases, tuberculosis, food for the invalid, emergencies, common injuries and first aid. A generation or two ago, we are told, a delicate woman was considered quite interesting, and fainting gracefully was an accomplishment to be cultivated. "But the woman of today cannot afford to be delicate; there is too much to interest her, and too much that she wants to be able to do and do well. A healthy body, doing its work without effort, enables one to accomplish and endure, and

leaves the mind free to develop. Women are now entering many new positions which up to this time have been filled by men, and in these new positions they are accomplishing a great deal. You do not want to be behind in the race; and since good health means greater efficiency, either at home or in business, you should run no risk of losing your health, nor hesitate at any effort that will help you to attain health if you do not have it. With the hope of giving to girls and women practical instruction for daily life, in terms clear to every one, this book has been written. Its purpose is to explain how a girl may attain health and happiness in the present and lay the foundation for a sane and vigorous old age; to give directions for preventing the spreading of infection from cases of communicable diseases; and to furnish instruction in caring for oneself and one's family in time of accident or sickness in the home."

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HYGIENE OF THE EYE. By William Campbell Posey, M. D., Ophthalmic Surgeon to the Wills and Howard Hospitals, etc., etc. Phila., Lippincott, 1918. 344 pp. 120 illustrations. \$4.00 net.

How the most valuable of all the special senses may best be conserved, and many of its common defects, injuries and diseases are the topics elucidated in this voluminous and admirable work. Although specialists are doubtless more or less familiar with its contents, the author's purpose is to review the chief facts about the eye, its conservation and its hygiene for the physician engaged in general practice and for the general public. The twenty chapters include, among others, sections on the structure of the eye and parts adjoining; defects or anomalies of refraction; strabismus; optical defects and the general system; artificial lighting; diseases of the conjunctiva, lids, cornea, and of the interior of the eye; cataracts; glaucoma; wounds and injuries in the industries and trades; color-blindness; education of the blind; etc. Chapter VI, *School life and the care of the eyes*, deals with the matter of careful periodic examination of children's eyes; the hygiene of instruction as it relates itself to eye conservation; adequate lighting of schoolrooms; proper seating facilities; suitable book print; well-placed blackboards; proper paper; the need for establishing special classes for children who are very highly myopic, and for those who are partially sighted from other causes; and correct habits of using the eyes.

Four of the chapters are contributed by specialists; viz: Chapter VII: *Artificial Lighting*, by Dr. Herbert E. Ives, former vice-president of the Illuminating Engineering Society, etc. Chapter VIII: *Daylight Illumination of Rooms and Buildings from an Architectural Standpoint*, by William Copeland Furber, Architect and Consulting Engineer, Philadelphia, Pa. Chapter XIX: *The Blind: Blindness from an Economic and Social Point of View. The Education and Employment of the Blind*, by O. H. Burritt, Principal, Pennsylvania Institution for the Instruction of the Blind, Philadelphia, Pa. Chapter XX: *The Popular Movement for Conservation of Vision*, by Edward M. Van Cleve, Managing Director of the National Committee for the Prevention of Blindness. Save for these four chapters, the treatise is the work of Dr. Posey.

THE GARY PUBLIC SCHOOLS: PHYSICAL TRAINING
AND PLAY. By Lee F. Hanmer. General Education Board,
New York, 1919. XIX+35 pp. ill.

A striking feature of the Gary schools is the prominence given to physical education. The time assignment in the daily school program is unusual; most of the schools have both indoor and outdoor facilities, and special teachers are provided for all except the two smallest. Ample opportunity is afforded for orderly exercises of a corrective, body-building character, as well as recreative games and free play. The two largest of the nine schools are elaborately equipped, and all schools are so organized as to keep physical training facilities in use throughout the school day. Of the total time in the elementary school, Gary gives 2,697 hours, or 24%, to physical training and play, as contrasted with 927 hours, or 11%, the average in 50 representative American cities. Often pupils are excused from a part of this training for various reasons, yet the Gary authorities have undoubtedly viewed in a large way the place of physical training in modern education, and are easily giving to it double the time allowed in the average city system. The equipment is, as a rule, generous, both of gymnasium and grounds. In five of the schools there is to be found almost every piece of apparatus that a physical training instructor or a playground teacher might desire. Much of the apparatus was made in the school shops and installed, under the direction of the shop and physical training teachers, by the boys themselves. It should be added, however, that the smaller schools are very poorly equipped.

There are fifteen teachers of physical training in the nine schools, assisted by twenty special or pupil teachers. Over all is a supervisor, who also has teaching duties. 9 of the teachers have had two years, and 4 have had three years of special preparation. It costs the system (1915-16), exclusive of supervision, supplies and equipment, \$2.86 per pupil of average daily attendance to maintain this work. There is no special attention given by regular class-room teachers to physical education, work in this centering almost exclusively in the gymnasium, swimming pool and playground. The instruction groups are large, often much too large, making the daily 7-hour program for the physical training teachers a heavy one. This, according to the investigator, constitutes the most serious criticism of the entire system. The numbers to be managed are too large and the ages of those in the same instruction group too varied. The teachers are unable to give to individuals the needed attention or the exercises suited to them. Excessive emphasis is consequently placed upon free play. Gary pupils therefore have little idea of what supreme effort to do one's best really means. Their exercises as a rule lack snap, vigor and finish. Some good athletic teams are developed, but sufficient attention is not given to the athletic training of all children. The report concludes: "While, therefore, the Gary schools offer splendid opportunities in physical training and play, it is only fair to state that these possibilities are not fully realized. Nevertheless, to those interested in the physical welfare of boys and girls, the Gary schools offer encouragement. They have performed a distinct service in emphasizing the education of the whole child—physical as well as mental. In theory, they have come near doing justice to physical education; their practice is also in some respects commendable, but, in general, the execution of the plan falls too far behind the conception and intention."

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SCHOOL HYGIENE AND TRAINING FOR CITIZENSHIP

A SUGGESTED COURSE OF STUDY IN HYGIENE
FOR THE PUBLIC SCHOOLS

BY LAWRENCE AUGUSTUS AVERILL

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GOOD CITIZENSHIP THE ULTIMATE GOAL OF EDUCATION. The aims of education have been variously defined by different writers and theorists of the past and present. The best working definition of education appears, however, to be training for social adjustment, and from this viewpoint the highest test of the public school is to be found in the kind of citizens it turns out. Man's real value is social, not individual; community, not family. Democracy means more than a job and a home; it means also citizenship and communal living. It implies co-operation and interdependence; it means freedom under the law; it means altruism and forbearance. Good citizenship in a democracy therefore is positive and progressive.

The ideal of democracy is a somewhat complex one in which popular government, wise leadership, broad institutions, pro-

ductive activity and a refined national consciousness each finds a place. If our country had yet attained or even approximated this ideal in every respect, the modern agitation for better citizenship would not have been called forth. But our country is the greatest and most gigantic experiment in democracy and true citizenship that the world has ever seen, and it would be inconceivable that an experiment of such magnitude could be checked up in the relatively brief period of time during which the nation has been in existence.

Then too, the experiment is complicated utterly without precedent by the infusion into our body politic of a most cosmopolitan element from other lands and by the consequent admission into our public schools of several hundreds of thousands of children possessed of different ideals, different traditions and different inheritance.

THE HOPE OF DEMOCRACY IS VESTED UNEQUIVOCALLY IN THE PUBLIC SCHOOL. Our ultimate hope for the safety and dominance of democracy lies now as never before in the public schools. Education for citizenship, for true Americanism, becomes the cry of the hour. If our land is the great melting-pot for alien races our schools must furnish the fuel and energy under the crucible. If there is one institution, one activity, that cannot continue as usual under the stress of the times, that institution is the public school. *Not as usual but ten times more than usual* must be our gauge. Not the provincialized three R's, but the socialized three R's. Not the unrelated school but the community school. Not the precept of individualism but of *civism*.

Side by side, therefore, with the orthodox curricular subjects, and as closely as possible correlated with and related to them, the teaching of the duties and responsibilities of citizenship in our public schools becomes a matter of supreme importance if the American type of tomorrow is to be a fitting and honorable successor to the American type of yore. The recent establishment within the United States Bureau of Education of a department of Civic Education, and the initiation on the part of some of our leading states of a training-for-citizenship program are the logical consequents of the pressing need of such training of a nationwide scope.

Already, therefore, the attention of both educational theorists and practical schoolmen is focussing upon this tremendously important matter. Courses of study are in many places already undergoing significant transformations in order better to empha-

size citizenship. In Lawrence, Massachusetts, the so-called "Lawrence Plan" is being carefully worked out under trained educators, and the results attained are striking. Civics is having a re-birth in the normal schools. School boards and school officials both local, state and federal are scrutinizing carefully the existing courses of study with a view toward replacing the emphasis, for it is a fact that nearly all the subjects of the curriculum are capable of redirection. The time is ripe for this reorganization of the orthodox curricular subjects. The psychological moment is at hand. Away with the formal, the unrelated, the impersonal! Let us have the personal, the communal, the civic emphasis in our school work.

WHAT THE TERM CIVICS REALLY MEANS. The term *civics* is a very broad and inclusive one. As ordinarily interpreted in the past it has too often been limited to a study of the problems of local and state government and the rights of citizens under the law. In the present emergency, however, the term must be given its widest interpretation, and be made to include not only a study of man's *rights*, but of man's *duties* as well. Thus, the fact that a man is cognizant of the law which prohibits spitting upon the sidewalks or in public places does not necessarily imply that he is a good citizen; but it is a token of eminently good citizenship if that man so appreciates his duty toward his neighbor and toward society as to refrain from spitting overtly upon the walk even when no one chances to be looking. Similarly, it is not necessarily an earnest of good citizenship if a man is aware of the right of suffrage guaranteed him under the law; but it is an evidence of the finest sort of citizenship if that man regards this privilege in the light of a social duty, and never willingly misses an opportunity of going to the polls in the interests of the common weal.

The term *civics*, then, implies, as we stated above, not only forbearance before the law, but, more positively, it implies a subjective and sympathetic appreciation of the whole range of man's social relationships with his fellow man. Obedience to law is liberty—and liberty merely; appreciation of law is citizenship. The former means merely freedom from restraint—passivity; the latter means co-operative citizenship—progress.

THE RELATIONSHIP OF HYGIENE TO CIVICS AND CITIZENSHIP. One of the great means of attaining true co-operative citizenship is through the proper appreciation of the fundamental principles of hygiene—personal and community. It is the aim of this paper to enumerate these principles—insofar at least as they can be readily incorporated into the work of the public schools.

The term *hygiene* means *health*. Health is both personal and community, and as such may well be looked upon as the starting-point of good citizenship. Consequently, hygiene becomes one of the curricular subjects which lends itself most readily and most satisfactorily to the new point of view. It cannot be doubted for a moment that the child who grows up with a health consciousness which has been wisely and broadly cultivated throughout his school life will be for that very reason a citizen with a higher and broader civic consciousness. Just as arithmetic, grammar and history function in maturity, so hygiene will likewise, if properly taught, modify future action and attitudes.

PERSONAL HYGIENE AND TRAINING IN CITIZENSHIP. The chronic condition of a person's health is often a fair index of his value as a citizen. Good health implies good personal habits. Habits are formed only in youth, and chiefly before the middle teens. Everyone knows how difficult it is to break old habits that have fastened upon one in childhood. It follows, therefore, that it becomes one of the supreme duties of the public school—inasmuch as long testing has demonstrated the home to be often negligent in such matters—to foster correct habits of health in the children. Nearly every moment passed in the primary grades is a psychological one for fixing habits, and if the school neglects the opportunity thus offered it, it will be hindering the advancement of the cause of good citizenship in a very vital way.

COMMUNITY HYGIENE AND TRAINING IN CITIZENSHIP. Neighborhood or community hygiene and sanitation offer one of the finest sources for field work in good citizenship for older children. Community health is a phase of hygiene which has received scant attention in the past, and none thus far in the schools. It is apparent, however, that no one can be a thoroughly good citizen and be at the same time ignorant of some of the great principles underlying the wider aspects of hygiene and sanitation. Here is a field where it is easy to demonstrate to school children in how far we are all our brothers' keepers. The great lesson of co-operation may be learned here in such a direct way that it can never be forgotten.

HYGIENE TEACHING IN THE PAST. But if we are to revive and remodel the old *physiology* as taught in the past there must be something of the nature of a complete revolution accomplished. To continue longer as we have been accustomed to proceed in the past spells disaster. Physiology has long been a subject of study required to be taught in the elementary school, but teach-

ers have almost universally pronounced it a failure as it has ordinarily been taught. And failure it has too often been, partly because the teacher could not get away from the anatomical viewpoint which the text-books were guilty of exploiting; partly because she herself had had little or no training in the subject; and partly because she did not understand the psychological method of approach. Instruction in physiology has become, therefore, a sort of formal drill in the principles of human anatomy, which is of little value to school children. In one schoolroom recently visited—in which the thermometer read 76 F.,—a teacher was found to be expounding from a textbook the intricacies of the lymphatic circulation to a class of boys and girls 12 years of age!

No textbook in physiology ought ever to be found in an elementary school, nor should the word *physiology* ever be mentioned in anything more than an incidental manner by the teacher. We must shift our emphasis from *structure*, and perhaps even *function*, to *hygiene*, *health*. It matters little whether a 13-year-old boy knows the scapula from the clavicle, provided he has been trained to stand and sit erect, nor is it vital whether a 10-year-old can describe the structure of his teeth, provided he has formed the habit of keeping them clean. *Any instruction beyond the hygiene of an organ—plus enough anatomy to render this knowledge fairly intelligible—has no place in the elementary school.*

WHAT FORMAL DRILL IN PHYSIOLOGY MEANT TO EIGHTH GRADE NEBRASKA SCHOOL CHILDREN. The following are some typical answers taken in 1916 from the pupils' examination papers in one of the best educational counties in Nebraska.* The inference is obvious.

- "A common disinfectant is small-pox."
- "Mastication is what is going on."
- "Epidermis is a certain kind of medicine."
- "The diaphragm is another name for backbone."
- "The bones are made up of hard mucous membrane."
- "Pericardium is something that will put you to sleep."
- "Respiration means all the different juices in the body."
- "The diaphragm is very delicate and located in the head."
- "Fumigation is when the air is shut off and death may come."
- "The Eustachian tube is a tube running all over the body."
- "The nervous system is a kind of tube where the blood vessels are in."

* Cf: *AM. J. SCH. HYG.*, Vol. I, No. 5.

"The process of digestion causes headaches and much impure blood. Fried potatoes often cause digestion."

"A disinfectant is anything you catch by going where they are. Measles and chickenpox are disinfectants. When you have them you should stay in the house and keep warm and try not to give them to others. Pimples on the face are not disinfectants, but some kinds are."

ALCOHOL AND TOBACCO. But little better results, unfortunately, have been achieved in instruction concerning the ill effects of alcohol and tobacco, which is required by statute in most states. It is little use to caution a boy that if he ever uses tobacco in any form he will be a prey to indigestion, chronic dyspepsia and the dread "tobacco heart!" The boy's values are present, not future; his life is measurable only in terms of the imminent. Nor is it the shrewdest sort of pedagogy which paints lurid pictures of the effects of alcohol upon the tissues, and assures young people that drunkards have highly inflamed mucous membranes all along the alimentary canal! The mysteries of the unseen interior of his body are as unattractive to the practical child as they are invisible.

THE END OF HYGIENE TRAINING IS NOT ANATOMICAL KNOWLEDGE BUT DEPENDABLE HEALTH HABITS AND HEALTH ATTITUDES. The far too common practice of attempting to teach young children under 10 or 12 the physiological effects upon the system of stimulants and narcotics, or facts concerning the structure of the body tissues, or the functions of organs, or the circulation of the blood, or the secretions of the glands, etc., is a waste of time and effort. Yet these are but a few of the topics mentioned in many courses of study for children in the lower grades, and in part often required by the laws of the states. The mind of the child at this age cannot grasp material of this sort. Information must be concrete, definite and simple of comprehension. The point to be emphasized in the teaching of elementary hygiene is not the *why* in health but the *how* in health. It is a matter of secondary importance whether the child understands why his nails and teeth and skin should be kept clean; the important thing is that he be aided in the formation of the correct habits of keeping them clean. Similarly, explanations and reasons which depend upon a remote future condition of health or disease are of little consequence to childhood.

MOTIVATION IN HYGIENE TEACHING. This of course does not mean that there ought not to be strong motives to stimulate and encourage the child to form correct habits. On the contrary we

must look to our knowledge of child nature to supply us with motives, and cease depending upon what would presumably be sufficient motivation to adults. Such motives are to be found in the child's natural interests and instincts. (Pride, emulation, imitation, class and group or individual rivalry, activity, approbation, ambition, sportsmanship, etc., etc.) For example, a group of children are far more easily led to strive for better posture in sitting or standing through an appeal to rivalry or pride than through a discussion of the anatomy of the vertebra. Again, the same instincts, if properly appealed to, would more quickly and positively lead a child to keep his nails clean than would a peroration upon the bacteria that might be harbored under a dirty nail. The writer once knew a boy who experienced a sort of diabolical joy in the knowledge that millions of tiny organisms were growing at the ends of his very fingers! Was it his fault, or his teacher's, that he not only possessed but secretly took great delight in dirty nails?

THE PLACE OF THE TEXTBOOK. As indicated above, there is no place for the orthodox *physiology* in the grades. Beginning with the third school year, however, a great deal of supplementary reading may very profitably be introduced. There are already upon the market several series of hygiene readers which meet this need admirably. The Gulick Hygiene Series (Ginn and Co.) and the O'Shea and Kellogg Health Series of Physiology and Hygiene (Macmillan) are but two of many series now obtainable. Briefly, the characteristics of a good reader for the grades may be summed up as follows:—

- (1) Only sufficient physiology and anatomy to render the chief facts of hygiene reasonably comprehensible.
- (2) Emphasis upon health rather than upon disease.
- (3) A simple and interesting diction.
- (4) The psychological method of approach.
- (5) Copious and appealing illustrations.
- (6) Subject matter very concrete and closely related to the everyday life and experiences of the child.

Whatever its good points, however, the supplementary reader cannot of course be relied upon to furnish the major portion of the material for any except the lower grades. At best it should be in grades above the fourth merely a supplement to the course of study followed. It is needless to add that the material read should be studied intensively and be thoroughly worked over in the classroom. The wise teacher will strive constantly also to

insure direct applications of the health principles learned from day to day in the habits and attitudes of the children. In this way the knowledge gained tends to pass over more or less immediately into action and so become of more permanent value. This is especially true during the intermediate grades between the third and sixth, inclusive, while the emphasis is still upon personal rather than community hygiene.

A SUGGESTED COURSE OF STUDY IN HYGIENE. Following is a brief topical outline of such a course of study in hygiene as needs to be worked out to take the place of the older course in *physiology*, or *hygienic physiology*, as it has been more recently styled, ordinarily followed in the public schools. It is beside the purpose of this bulletin to present the details of the course, the aim being merely to enumerate the principal topics and relate them psychologically to the interests and age of the child. If we may judge from reports received from several school systems some variation of this course of study is already finding favor and is working out in a practical way under the direction of interested teachers.

Grades 1 and 2. *Health hygiene.*

Grades 3 and 4. *Habit hygiene.*

Grades 5 and 6. *Home and school hygiene.*

Grades 7 and 8. *Community hygiene.*

HEALTH HYGIENE for Grades 1 and 2.

Aims. There is no formal teaching of hygiene in the first two grades. The aim of the work in these years should be to insure that every child shall form those habits of personal cleanliness that are fundamental to neatness and happiness. Dr. Hoag speaks of this period of life as a time when a child's habits ought to be reduced as far as possible to an automatic level.

The following personal habits should have become so fixed by the end of the second grade as to give reasonable evidence of permanency:—

- (1) Clean hands, face, ears and skin to start the day with.
- (2) Nails trimmed and in good condition.
- (3) Scalp clean and hair brushed.
- (4) Teeth brushed and mouth in good condition.
- (5) Wearing neat, clean clothing and carrying a clean handkerchief.

Method. The only method required in these grades is a careful morning inspection conducted by the teacher, or by pupils under

her direction. Occasional health stories are always valuable if appealingly told.

Motive. Class, room, row or individual rivalry; pride; approbation, etc., etc.

Time. A minimum of 15 minutes a week.

HABIT HYGIENE for Grades 3 and 4.

Aims. The end of hygiene teaching in these grades is the same as in Grades 1 and 2, but with a scope so widened as to include the proper reactions to all the major health-sickness situations in the normal environment of the child.

Following is a list of suggested habits upon which more or less inclusively the attention of third and fourth grade pupils ought to be focussed:—

- (1) Proper food habits.
 - (a) Good and poor foods at home, for lunch, etc.
 - (b) Tea and coffee; tobacco and alcohol.
 - (c) Balanced diet.
 - (d) Mastication.
 - (e) Brushing the teeth.
 - (f) The common cup.
- (2) Proper fresh air habits.
 - (a) Schoolroom ventilation.
 - (b) Foul air in street cars, theatres, stores, etc.
 - (c) Breathing habits.
 - (d) Outdoor play and sports.
 - (e) Sleeping-room ventilation.
- (3) Proper temperature habits.
 - (a) Overheated rooms.
 - (b) Clothing for summer and winter.
 - (c) Colds and why we have them.
 - (d) Thermometers and their use.
- (4) Proper posture habits.
 - (a) Sitting; standing; working; playing.
- (5) Proper exercise habits.
 - (a) Exercise and health.
 - (b) Exercise and happiness.
 - (c) Ideal forms of exercise, such as swimming, rowing, skating, coasting, etc.
- (6) Proper habits of cleanliness.
 - (a) Bathing—warm and cold.

- (b) Clean hands and faces.
- (c) Hands away from nostrils and mouth.
- (d) Clean clothing.

Methods. Story-telling, supplementary reading, simple experimentation, occasional inspection; observation.

Motive. Class, row, group or individual rivalry; pride; approbation; curiosity; activity; the soldier interest.

Time. A minimum of 25 minutes a week.

HOME AND SCHOOL HYGIENE for Grades 5 and 6.

Aims. The purpose of the hygiene work in Grades 5 and 6 should be to give the children a wide range of information in matters of every day import to health and efficiency. Among the topics for study and investigation should be included the following:—

- (1) The water supply.
 - (a) Sources for school, home and city.
 - (b) The common drinking cup; bubblers and fountains.
- (2) Milk.
 - (a) Importance of keeping milk clean and cool.
 - (b) Milk for the baby.
 - (c) Milk as a food.
 - (d) Clean milkmen and safe sources of production.
- (3) Selection of food in stores.
 - (a) Cold storage of foods: use and abuse.
 - (b) Common adulterations and how to detect them.
 - (c) Substitutes and equivalents.
- (4) Refrigeration and care of foods in the home.
 - (a) Home-made refrigerators, coolers, milk shelters, window boxes, etc.
 - (b) Cleanliness of all food containers.
- (5) Garbage and wastes.
 - (a) Garbage buckets and scavenger departments.
 - (b) Disposal of waste papers and rubbish in the interests of fire prevention.
- (6) Sweeping and dusting.
 - (a) Hygienic versus non-hygienic methods.
 - (b) Floor oils; dust-absorbers; oil dusters and mops; vacuum sweepers, etc.
- (7) Flies, mosquitoes and other disease-carrying insects.
 - (a) Life-history of the fly and mosquito.
 - (b) Means of extermination.

- (8) Clean homes, clean yards and clean schools.
- (9) Infectious and contagious diseases.
 - (a) The common children's diseases. (Mumps, measles, colds, etc., etc.) Modes of infection.
 - (b) How diseases are ordinarily spread. (Simple and non-technical.)
 - (c) Vaccination, and other safeguards and preventatives.
 - (d) How to escape "colds" and throat affections during the cold winter months.
- (10) Pencils, towels, combs, handkerchiefs, etc.
 - (a) Interchanging of books, pencils, etc.; common use of towels; "swapping" gum, etc.

Method. The children in grades 5 and 6 are in the midst of the age of curiosity and dawning social consciousness. The methods of making the work in hygiene in these grades interesting and valuable will be determined accordingly. A little opportunity to observe something of the nature of bacteria should be given them in order that they may learn the more fundamental principles of disease and contagion. Contests in fly and mosquito extermination will prove surprisingly fruitful of results. Some simple experimentation with foods and food preservation will be both interesting and profitable. Time and facilities for experimentation, however, are always lacking in the already overcrowded curriculum of our public schools, and the most practicable methods of giving instruction in matters of health and sanitation will be for this grade, as for the third and fourth, story-telling, extensive observation and reports and wide supplementary reading and discussion. These, if wisely ordered, and directed, may be made to appeal markedly to the elements of a dawning social sympathy and interest in the child.

Motive. The instincts of rivalry, inventiveness, constructiveness and sympathy; the natural social interests; dramatization and group activity will furnish the needful motivation for the work of these grades. The project method will be excellent.

Time. A minimum of 50 minutes a week, with considerable time spent outside of school in observing and collecting data and in carrying out projects.

COMMUNITY HYGIENE for Grades 7 and 8.

Aims. The purpose of the work in hygiene teaching in the two upper grades should be to create in the child a strong and grow-

ing interest in the problems of neighborhood sanitation and health. The pupils in these grades have passed fairly beyond the age of individualism into the age of socialism. It is this which affords us a proper orientation for interesting them in the broader problems of citizenship. The emphasis now becomes altruistic, civic, communal.

While obviously the work during the preceding grades has been largely self-centered and individualistic, the child's mind in this age is opening outward and the time for real constructive work in training for future citizenship is at hand. The earlier instruction in personal hygiene has reached a climax, and the civic sympathy and appreciation burst forth.

While obviously a somewhat different course of study would have to be followed in the country from that applicable to the city, in general the topics suggested below should all find a prominent place in the hygiene work in Grades 7 and 8:—

- (1) Public markets.
 - (a) Cleanliness.
 - (b) Condition of foods offered for sale.
 - (c) Foods exposed to insects, handling, dust, etc.
 - (d) Appearance and habits of clerks.
- (2) Sewage disposal.
 - (a) Dangers from sewage improperly reduced.
 - (b) Study of local methods.
 - (c) Study of ideal methods.
- (3) Garbage disposal.
 - (a) Necessity for co-operation on the part of every family.
 - (b) Study of local methods.
- (4) Water supply.
 - (a) Principles of storing and filtration.
 - (b) Trips to local or nearby reservoirs.
 - (c) Essentials of a good system.
 - (d) House filters.
 - (e) Public drinking fountains.
- (5) Boards of health.
 - (a) Duties and importance.
 - (b) Members of the local board.
 - (c) Is it an active or a passive one?
 - (d) Necessity for co-operation; individual responsibility in the health of everyone else. *
- (6) The fly problem.
 - (a) Its importance.

- (b) Diseases carried by the fly.
- (c) Survey of local stables and other breeding places.
- (d) Methods of extermination.
- (e) Construction of fly-traps.
- (f) The responsibility of the home.
- (7) The mosquito problem.
 - (a) Mosquitoes are both a nuisance and a danger.
 - (b) The conquest of the mosquito in tropical countries; in the Canal Zone.
 - (c) Survey of local breeding places.
 - (d) The responsibility of the home.
- (8) Local disease.
 - (a) Study of vital statistics (local) in order to determine the most prevalent diseases.
 - (b) Study of possible common sources of these diseases.
 - (c) Crowded and overheated cars, theatres, stores, etc., as sources of illness in cold weather.
 - (d) The great white plague: the most fatal and disastrous of all diseases in America. What it is; how to prevent it.
- (9) Hospitals and sanatoria.
 - (a) Their value to individuals and to society.
 - (b) Special neighborhood or near-by institutions: tuberculosis, isolation, etc.
 - (c) Is the number of hospitals and dispensaries adequate to meet all normal demands locally?
- (10) Industrial and factory hygiene.
 - (a) The rights of the workingman to reasonable protection from disease and accident.
 - (b) Survey of local industrial plants and the work they are doing to conserve the health of their employees.
- (11) Street cleaning and sprinkling and removal of snow.
 - (a) Importance to health of street sanitation.
 - (b) Improved methods.
 - (c) Duty of every abutter of keeping the walks in front of his home free from snow and ice.
- (12) Public buildings.
 - (a) Ventilation, plumbing, etc.
 - (b) Safety.
- (13) Dumps.
 - (a) Surveys and reports of all local dumping tracts.
- (14) Fire protection.

- (a) Dangers from great conflagrations.
- (b) Local preventive facilities.
- (c) Loss through fires during preceding year.
- (d) Importance of building laws, inspection of lighting, plumbing, etc.
- (15) Parks and playgrounds.
 - (a) Value of recreation grounds to a city—both in money and in health.
 - (b) Local surveys.
- (16) Housing conditions.
 - (a) Overcrowding in poorer sections.
 - (b) Study of local conditions.
 - (c) The right of every family to air and sunshine.
 - (d) Dangers lurking in foreign quarters, etc.

Method. The work in hygiene in Grades 7 and 8 is designed to bring home to the pupils—most of whom will never receive further systematic instruction—the great lesson of co-operation in matters pertaining to the public health. To this end, any method which will encourage an attitude of personal responsibility in the pupils should prove an admirable one. Among such methods may be mentioned the local survey of public markets, buildings, theatres, factories, etc; the study of taxation and the apportionment of its funds to the public health work; trips to near-by reservoirs, filter beds and preserves; the judging of local markets in percentages according to a prearranged scale; the study of local and state vital statistics; the organization of school boards of health, city governments, hospital staffs, etc.; and the frequent use of slides, exhibits and other illustrative material. Constant use of the textbook in community hygiene should be provided for, as should also occasional opportunity for a brief study of yeasts and molds as related forms of bacteria, to the end that the general principles of infection may be the better understood.

Time. A minimum of 50 minutes a week in the classroom.

GENERAL SUMMARY. In the preceding course of study, as outlined, there is necessarily much overlapping from year to year. Real teaching of hygiene to boys and girls is so largely determined by incident and “psychological moments” that any suggested outline of procedure must of necessity lack strict co-ordination and progressiveness. Thus, it would not always be wise to discontinue the regular morning inspections with the beginning of the third grade. Nor would emphasis upon correct habits of posture in grades 3 and 4 result always in such permanent formation of these habits that no subsequent attention would need ever

to be paid to them in higher grades. Again, it would be a serious mistake to delay all instruction in the problems of community sanitation until the 7th. and 8th. grades. The wise teacher will be always on the lookout for the psychological moment for driving home a health truth. For example, if a teacher had planned to devote the first week in March to talks upon the common drinking cup, it would be a great error for her to overlook instances of two or three children drinking from the same dipper in the first week in November. Or again, if her program called for first-aid lessons during the last week of April, it would be an equally great mistake for her to permit a boy on the playground to bandage a badly cut finger with a dirty handkerchief two weeks or two days before that date. The time to strike in health matters as in all other situations is when the iron is hot.

BIBLIOGRAPHY OF SELECTED REFERENCES. The following list of books will be found valuable as supplementary readers in hygiene. The writer has indicated in each case the grade or grades to which in his estimation the various texts are best adapted. The list is by no means complete, but each book listed contains much excellent material.

- (1) Brown, Bertha M.
Good Health for Girls and Boys (Heath)
152pp. ill. Grades 5 and 6.
- (2) Bussey, George D.
A Manual of Personal Hygiene (Ginn)
156pp. Grades 7 and 8.
- (3) Coleman, Walter M.
A Handbook of the People's Health (Macmillan)
307pp. ill. Grades 6, 7 and 8.
- (4) Coleman, Walter M.
A Health Primer (Macmillan)
189pp. ill. Grades 3 and 4.
- (5) Conn, H. W.
Introductory Physiology and Hygiene (Silver, Burdett
and Co.) 211pp. ill. Grades 5 and 6.
- (6) Gulick Hygiene Series (Ginn and Co.) 6 Vols.
Vol. 1. Good Health. Grades 3 and 4.
- (7) Vol. 2. Emergencies. Grades 4 and 5.
- (8) Vol. 3. Town and City. Grades 7 and 8.
- (9) Vol. 4. The Body at Work. Grades 6 and 7.
- (10) Vol. 5. Control of Body and Mind. Grades 7 and 8.
- (11) Vol. 6. The Body and Its Defenses. Grades 5, 6, and 7.

- (12) Hutchinson, Woods.
Health Series. 2 books (Houghton Mifflin)
Book 1. The Child's Day. 183pp. ill. Grades 2, 3, 4, and 5.
- (13) Book 2. A Handbook of Health.
348pp. ill. Grades 5, 6 and 7.
- (14) Hutchinson, Woods.
Community Hygiene. 310pp. ill. Grades 7 and 8.
- (15) Jones, May Farinholt.
Keep Well Stories for Little Folks. (Lippincott)
140pp. ill. Grades 1, 2 and 3.
- (16) O'Shea and Kellogg Health Series. (Macmillan) 4 vols.
Vol. 1. Health Habits. 216pp. ill. Grades 3, 4 and 5.
- (17) Vol. 2. Health and Cleanliness. 301pp. ill. Grades 5 and 6.
- (18) Vol. 3. The Body in Health. 324pp. ill. Grades 7 and 8.
- (19) Vol. 4. Making the Most of Life. 298pp. ill. Grades 7 and 8.
- (20) Overton, Frank.
General Hygiene. (American Book Co.)
377pp. ill. Grades 5, 6 and 7.
- (21) Overton, Frank.
Personal Hygiene. (American Book Co.)
240pp. ill. Grades 4, 5 and 6.
- (22) Ritchie, John W.
Primer of Sanitation. (World Book Co.)
196pp. ill. Grades 6, 7 and 8.
- (23) Ritchie and Caldwell.
Primer of Hygiene. (World Book Co.)
184pp. ill. Grades 6, 7 and 8.



HEALTH AND OUR RURAL SCHOOLS

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The train slowed down for a momentary stop at a diminutive station half hidden by a riot of sumach, wild cherry, and struggling young maples. The solitary passenger stopped at the edge of the platform to draw a deep breath from a volume of air too boundless and clear and too full of vitality to be greatly polluted by the trail of smoke her puffily important engine had imposed upon it. "What a heritage for the children of strong men!" she thought, remembering wistfully helpless little city folk crowded into large classes under the domination of a heating system and a relentless janitor. "What a heritage," she repeated, as she rounded a turn in the road and dodged an unseeing young Titan who had dropped his dinner box with a whoop as he bounded into a game of scrub for the remaining three and a half minutes "before nine."

She halted a moment on the rickety upper step and drank in the stretch of hill and field and sky. She wondered if the town fathers had had an eye for beauty when this spot was selected for the school site and a real yard provided for the children's play. "Such a chance for out-door recitations!" she commented. And she crossed the threshold.

"I was just going to ring the bell," explained the very young, much frightened teacher, "while Marion finishes dusting," but Marion, abashed by such notoriety, sank into her seat and buried herself in a book, with blushing face and unwashed hands. To come into such an atmosphere, from the wide, clean, Out-of-doors! The visitor sighed and coughed and waited for the windows to be opened,—an unwarranted optimism.

The line of boys and girls, each refreshed by a hasty drink from the one cup formed a happy, vigorous little army, and as they passed by her, one after another, wiping moist hands on trousers or handkerchief, a mighty sense of responsibility seized her. "Couldn't each of these children have a drinking cup of his own?" she asked. "Couldn't they bring them from home?" she continued, facing blank surprise with increased determination.

"Why, some of these children are..." and the teacher implied a division of northern Europe. "And two more are..." she gasped. "I don't think they have any cups." The visitor had taken a sudden flight across the turbulent continent to the land of the two more children. Then her gaze wandered back across children of Pilgrim ancestry to those from the more frigid Fatherland. "Fine little Americans, all of them," she asserted. "I'll show you how to make cups of butter-paper."

At recess the two grew friendly over the how, the why, and the when of individual drinking cups. "They have a covered water-jar in the next town, remarked the teacher as she patted the last fold. "I wonder if Mary knows about cups. She's a normal graduate." "Of course she does," replied the visitor with finality. "And open windows, and the peril of moving dust, and the economics as well as the hygienics of clean hands, and many other things your superintendent or the school physician will have to teach you, one lesson at a time, through months of patience—and of rewarded effort, you dear, little Beginner-to-learn," was her mental supplement. "How far is it to Mary's school?" she asked aloud. So her second visit that day carried her across a town boundary.

Not only did she find herself across a town boundary line, but apparently in a different world when she arrived at Mary's school. The tulips beneath the window waved proud greetings and a bouquet of violets beckoned through the window from the comfort of their inconspicuous vase. There *was* a covered water-jar, and better yet, it was clean inside. With compassionate afterthought for swinging feet and bent spines, and rounded shoulders, she noted that these children lived in pleasant adjustment with their seats and desks. She saw gymnastics while the wind rioted with her hair and brought new life into every corner of the room. And the children did their formal writing drills to the music of their own victrola while the teacher used her voice and energy for constructive criticisms. Such a saving of energy! She noticed a quiet showing of hands before a child took possession of a coveted book. Such an incentive to the habit of cleanliness!

The visitor settled contentedly into the one guest chair and divided her interest between the Dred Scott decision and a sepia print of Hoffman's Head of Christ. The discussion grew interesting. It was growing more and more evident that Americans of Polish ancestry may have firm ideals of American justice. Her eyes wandered from the picture to the earnest faces of the class in history. Then they fell on something else.

"Your medical inspector will wish to know about the little girl in the red sweater," she said, as she rose to go. "Does she have them often?" "Oh, yes," cheerfully replied Miss Graham. "She's a chronic. They catch them from each other. I can't make her mother see that they ought to take the whole family in hand at once. Marie will be back all right on Monday. And a few days later I'll send her home again. Too bad; she can't afford to miss her reading so much. Oh, no, I never notify the doctor any more about these trivial things. He has no time to waste on these foreigners."

In a secluded spot the visitor took off her coat and shook it well; likewise her hat. "In my next incarnation, she confided to a cedar wax-wing, I'm going to be a rural district nurse." But only a few hours later she engaged upon internecine warfare, armed with a fine-toothed comb.

The last school of the visitor's day was noted for its neatness, its order, and the excellence of its three R's. The windows were spotless, made so by the older girls. A poster filled with neatly written names proclaimed authority for immaculate boards, fresh water, the orderliness of desks, and the cleanliness of furniture and floors. The school machinery moved like clock-work; the children recited, argued, or questioned with both seriousness and vigor. Harmony and cooperation were evident, with wonderfully blended leadership. The soldierly files had passed out, the two had talked over many things concerning education, and the last capable monitor had said, "Good night." "What a wonderful organization you have," said the visitor, as she looked again, full, into the strong, kindly face of her hostess. "These boys and girls will grow into powerful men and women. You can help them to become—anything!"

Then she followed her nostrils. "Are you getting ready to paint?" she asked. "We *have* painted," fell on her amazed ears. "Of course it's only the ante-room, but each child passes through at least eight times a day. The markings were a disgrace. The children agreed that they were. They did errands to buy this paint," she added proudly. "Let me show you what they have done to the out-buildings," and she led the way with vigor from which there was no retreat.

Quite unexplainably the parable of the loaves and fishes took possession of the visitor's mind. By what alchemy might such women as this be multiplied? A problem so complex and so desirable must be left to further ponderings. The visitor came back to realities. "What does your superintendent think about

this?" and her eyes grew keen. Had she stumbled on a step toward the achievement of magic? "Every school building in this town will greet the new year with cleanness," came the reply. And a note of conscious power had come into the voice of the pioneer.

With exaltation of soul the visitor came back to the anteroom. How splendid! By the children themselves, because of inborn vitality, and with conscious determination to be self-respecting. "And now," she beamed, "they can forget all about it. Every reminder must go. A full coat of paint..." "Costs good tax money," broke in the one who would live with it daily. "I wish it were possible," she added, rather wistfully, "but our wash-outs." "Oh, roads, roads!" came flashing back, "is there nothing so important as roads? What does your Art supervisor say about these walls?" "There's no such animal," and even the teacher smiled. "This town doesn't need Art," she added. "It has gotten along nicely without it." "Paint doesn't cost much," appealed the visitor. "They're spotty," with inborn persistence. "But decent," shot out the curt rebuff.

That the mental hygiene of an entire school population should await the voice of a power that is not, or that the spiritual welfare of a next generation should be placed beneath roads that must be, are reflections that contribute little to agility. The visitor and the train puffed away from the station, both laboriously, and just barely, together.

"It was a most interesting day," went into her official report—with many entries not included here. For the life of a rural school has many sides and each is a theme for much thought, for great hope, for some discussion, and for splendid action.

Among its many phases of interest and of responsibility the health of our future men and women seems worthy of first consideration:—the health not only of body and mind, but of soul. With each other consideration by which the choice of subject, method, or administration must be weighed, surely we shall not fail to include its influence upon the physical well-being of the child, upon his intellectual acumen, his habits of mind-activity, and upon the attitude of spirit by which he will form the habit of interpreting whatever may come before his attention scholastically, in business life, or in social adjustments.

What are some of the things we shall insure for our children in order that they may grow up with strong bodies to serve as the finely tempered tools of imagination, ambition, and effective application? How shall we train them into healthy, executive,

social sympathy? Surely the first of these is fresh air, to be had for the lowering of a window in every country school. Many rural schools spotted about unexpected corners already live up to their privilege. The time must be near when every teacher displaying the confidence to draw a salary check will have given clear evidence, also, of her understanding of ventilation, of the distribution of heat with relation to ventilation, and of a working appreciation of the tonic value of fresh air.

She will demonstrate her ability to ventilate without danger to even the most delicate of children eligible to attendance upon a public school, not only as conviction well-expressed on paper, but also as a reflex school-room habit.

Nutrition will be brought to nerves and muscles through the intelligently directed gymnastics made up of the special exercises the children need, given for the most helpful length of time, at each time when the children will most benefit. Rounding shoulders will sink into right contour, chests will expand, and bodies assume habitual poise because gymnastics having outlived mere formal observance, have developed into an instrument for the upbuilding of the race.

Nutrition will be further stimulated by the warm lunch which is the natural right of every healthy, active country-child. The warm lunch itself will attain increasingly good balance. With it, too, will come training in the art of setting forth an attractive meal, of masticating properly, and of cultivating the "sense of cheerful companionship and of cordial merriment which aids digestion."

The teacher will show herself sensible to the readings of her school thermometer and her children will pursue their study of subjects unhampered by sensations of uncomfortable heat or of too great cold.

Among these subjects will be included the study of that most important R, right living, and classes in practical hygiene will be given, everywhere, as they already are in many schools, from the first year throughout the course. The course of study will be prescribed by experts in biology, in medical knowledge, in nursing, in dietetics, and child-welfare, while the working out of methods will be given into the capable hands of teachers, after consultation, with further consultation, and with the frequent revision which gives continuing vitality to educational work.

Under such programs and with such revisions we shall grow sensitive to the activities by which our children learn as well as

of the processes by which they grow. Cross lights will disappear from even the most remote cross-roads school-house. No distracting sound of trolley, heaving coal, or other raucous noise will be allowed to strongly influence concentration upon any subject or to undermine the pupil's nervous force. School locations will be selected with consideration for those conditions under which both instruction and study may be most satisfactorily accomplished, and buildings will be constructed with a jealous eye to the inconspicuous support of physical well-being. These considerations will include heating, lighting, and architectural proportions with relation to location; they will even emphasize such small details as lifts or stairs, tints for walls, and the placing as well as the character of the pictures to be hung. They will include the needs of little folk. The medical inspector will find sanitariums, the silent, physical influence of wall or floor, and the moral attitude within his range of duty. A special committee made up of a health authority of wide experience, the superintendent, a parent, an experienced rural teacher, and the fire inspector, will assist the school committee to decide how large the outer porch shall be, as well as how the outside door shall be hung in every individual rural school. These, and many other details of physical surroundings which are in their essence ethical, will cooperate with the instruction by which the child attains to power.

More and more we shall train our children into intellectual health and power. The way in which the mind of the child develops, in its clear promise of the man's ability, gives such new impulse to instruction, that teachers more and more pay tribute to the way by which the pupil learns, while they continue to take careful note of the result. To guide the child's habits of study the teacher is more and more bringing books to school: sets of books for research, concerning a single topic, single books adapted to many uses, and books in which children may wander at will to discover their special bent. With regard for the way he uses reference material, with timely suggestion, and with definite instruction, the teacher studies and directs each pupil while the pupil studies. So this grows more and more an important period of the day until the student gives evidence of a mind whetted to the keenness that brings much from books with the least possible expenditures of nervous force. Then he swings off to the nearest library with a topic in his pocket, anticipation in his heart, and his head high. He will maintain his point of view with conviction, or revise it with equative self-respect. In-

tellektual strength will develop through properly stimulated, well-directed exercise, even as the body grows strong through right eating, right sleeping, and proper exercise.

By similar exercise, pleasantly devised, and magnetically directed, the social circulation will grow equally strong, and tinged with healthy give-and-take. The school contests in feats of physical strength will broaden into the town field day, the inter-town athletic meet, or the county contest which already helps to make life worth inhaling deeply through many countryside. The warm-weather meet with its picnic and the sense of kinship developed in common appreciation of a well directed feat will lead to exhilarating rides over snowy roads to town or inter-town debates on questions of general interest. They will lead to mighty cooperation for the public good. So will the doctrine of a sound mind in a sound body grow more and more effective, through clearer and still more clear interpretation in the terms of daily need, through increasing respect for each essential and through broad cooperation under the leadership of experts.

PUBLICATIONS RECEIVED

HEALTH EDUCATION IN RURAL SCHOOLS. By J. Mace Andress, Ph. D., Head of the Department of Psychology and Child Study in the Boston Normal School, Boston, Massachusetts. Boston, Houghton Mifflin Company, 1919. 321 pp. ill.

This volume is based on the conviction that the practice of hygiene should be one of the foremost of the aims of the school. It is intended primarily for the teachers in the rural schools. Little attention is given to physiology or to theory except as knowledge of them seems necessary for practical health training. An attempt is made to point out the most important problems of hygiene and sanitation that confront the average teacher and to suggest how these problems may be met with a fair degree of success. To sum up the purposes of this book, it aims to present (1) the reasons why health education is so important; (2) a rather complete discussion of the principles of pedagogy involved; (3) subject matter on hygiene not usually available in the books accessible to teachers; (4) references to the best literature for teachers and children, particularly that literature which may be secured free or at a nominal price; (5) drawings of hygienic devices which children may be taught to make through the instruction given; and (6) carefully thought-out plans for getting results, not merely in terms of knowledge, but also in training children in habits of personal hygiene, in getting them to improve the sanitation of schoolhouse and grounds, and finally in suggesting how the school way influence rural communities in health matters.

Health Education in Rural Schools is a book covering an important though heretofore largely untouched field. Teachers in the country should find it an inspiration and a help in the fashioning of their courses of study.

THE WINSTON SIMPLIFIED DICTIONARY. Edited by Dr. William D. Lewis and Dr. Edgar A. Singer. The John C. Winston Company, Philadelphia and Chicago, 1919. 820pp. ill.

This is an elementary dictionary designed to meet the needs of the young student struggling with the discouraging "dictionary habit." A feature of the work is the simple, non-technical language used in the definitions. A great many illustrative sentences and phrases are included, and for a like purpose a generous number of pictures appear. The typography is large and clear and the pages are for that reason rather attractive than the reverse, as is occasionally the case in small dictionaries. The pronunciation of words is indicated by a phonetic respelling with diacritical markings, and a key to the pronunciation is given at the foot of each page. The vocabulary includes not only all the words in ordinary use, but also the vocabularies of the sciences, history, civics and current events that are so rapidly growing in both elementary and secondary schools. The appendix also includes much interesting and valuable material.



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THE INTERALLIED CONGRESS OF HYGIENE IN PARIS *

By DR. V. H. FRIEDEL, *of the Musée Pédagogique, Paris*

Translated by Lawrence A. Averill, Editor of THE AMERICAN JOURNAL
OF SCHOOL HYGIENE

The war has served to place a new emphasis upon hygiene, and it is to be hoped that this time neither the indifference of the sceptic nor the paralysis of routine will prevent hygiene as a science from accomplishing its tremendous work for health. Physical hygiene and mental hygiene have won the war: physical hygiene and mental hygiene must guarantee to war-torn humanity the fruits of peace. It is true that before the war we in France were not without rules and formulæ in every department of hygiene; we were not without excellent treatises and manuals; our societies and associations of hygiene had the highest of motives as well as the most exact information available in their several fields. Notwithstanding these circumstances, however, their emphasis was unfortunately becoming more and more academic and impractical. The doctrines which they were promoting only occasionally reached the attention of the authorities, who deemed their duty to have been fully discharged when they had published the doctrines, regardless of whether any one applied them or not.

The war has taught us the supreme importance of health to the human race. Thanks to the observed laws of hygiene and sanitation, our soldiers knew neither fatigue nor sickness. But there is another side to the story: it is the future. Thousands of towns

*SCHOOL HYGIENE, (English) Vol. X, No. 2, June, 1919.

and villages have been reduced to ruins; if anything of good can possibly come of such evil it is that properly applied laws of sanitation shall bring it about that healthier towns, villages more fit to preserve the race from the ills which beset and decimate it, may rise from the ruins. The homes of peasant and laborer alike must meet the demands of sanitary law to the end that the infant mortality rate may be substantially reduced and that tuberculosis and epidemics may no longer wreak their tremendous ravages. To this end also, observance of all the laws of physical, mental and social hygiene must come to ennoble and enrich the daily life of our citizenry.

This is the program which the *Comité National de l'éducation physique et sportive et de l'hygiène sociale* has outlined for itself. The *Comité* was founded during the war by two deputies, MM. Henri Paté and Dr. Doizy. The Government has been in such sympathy with their efforts that there has been talk of creating in it the office of Minister of Public Health. The *Comité* recently held its first congress at the Sorbonne. It was designed to be an interallied congress. Thirteen sections were at work, upon the following questions:

(1) Sunshine and water; (2) sanitary homes; (3) rural hygiene; (4) city hygiene; (5) motherhood and infancy; (6) school hygiene; (7) physical education; (8) and (9) sanitary prophylaxis; (10) industrial hygiene; (11) post-school hygiene and moral prophylaxis; (12) hygiene of travel; (13) economic bearings of hygiene.

What especially interests us here is school hygiene. This section was presided over by Dr. Méry, with Dr. Dufestel acting as secretary. Both names are well known among the promoters of school health work. Following are, briefly stated, the principal resolutions adopted as essentials by the section:

- (1) Organization of school medical inspection.
- (2) Development of school feeding.
- (3) Establishment of open-air schools.
- (4) Making sanitary of all school premises.
- (5) Installation of baths.
- (6) Instruction in respiratory gymnastics.
- (7) Development of manual work and continuation schools, among which schools for the amments are not to be forgotten.

It is especially important that

a. the schools be remodelled or constructed new according to the dictates of modern hygienic law, with suitable location in open places; that the plans be submitted to competent authorities, in-

cluding teachers and physicians; that all schools be provided with extensive playgrounds; that they be provided with furniture adapted to the size and needs of the children, and approved by the above-named authorities; that they be supplied with pure water and facilities for bathing; that teacherages befitting the rank and station of the teacher be established.

b. That a law requiring the medical supervision of all schools be enacted immediately by the Senate and Chamber so that it may be in full operation with the reopening of the schools.

c. That school lunches be provided wherever possible, both in the cities and the rural districts. These *cantines* should be under the surveillance of the school authorities, supervised by the school physicians and equipped with appropriate dining-halls.

d. That open-air schools be furnished for the children in the towns, and that classes be held in the open during the pleasant weather.

e. That there be a corps of school nurses carefully distributed throughout the school system.

f. That *pediculosis* be regarded as an infectious disease, and that legal action be sanctioned against parents who fail to keep the heads of their children clean.

These resolutions have been adopted as a result of no little discussion of reports made in part by physicians who have seen at close quarters the sufferings of the children in war-invaded areas, and in part by those persons associated with agencies organized behind the battle-zone to safeguard the welfare of children. It was but natural, of course, that our first care should be to look after the unfortunate victims of the Hun, and in this work of succor and relief we have been nobly aided by our allied friends. But we must not stop here: the vision must be a broader one than this. We desire that all France—nay, that all allied countries should have a new birth of hygiene, effectively and universally practiced.

It is beside the point here to enumerate all the resolutions adopted by the *Comité*, and recommended to the several allied governments. Of supplementary interest here, however, are those which refer to physical education. The section on Physical Education, with a view toward the improvement of the stamina of the race through a system of physical education, has adopted the following platform:

a. That such budget for physical education shall be provided by the public officials as shall be necessary to insure that the

youth in the invaded areas may reap the full benefits of a comprehensive system of physical training; and that to this end clubs, unions and other civic bodies be urged to organize their efforts and energies at once.

b. That there be created at once (1) a governmental agency for the control and direction of physical education, the same to reside in a minister, secretary or other designated official; and (2) that there be founded a national normal training institute designed to prepare teachers of both sexes, and equipped with a research laboratory.

c. That special diplomas be granted those who are thus trained to be teachers of physical training, and that such teachers be held in the same esteem as that enjoyed by other teachers.

d. That teaching of anatomy and physiology, insofar as either is related to physical education, be done in the faculties of medicine.

e. That in every *commune* there be provided playgrounds, well-ventilated gymnasias, baths, swimming-pools, ranges for archery, etc., the necessary land to be provided gratis by the towns.

f. That the school properties comprise spacious grounds, furnishings adapted to the age of the child, and *cantines* necessary for adequate school feeding. Medical inspectors and school nurses are to be available.

g. That open-air schools and special schools for the anæmic be included in every system.

h. That so far as possible the program as outlined be put into operation by private initiative without waiting obligatory action following governmental ruling.

To quote from the very excellent speech of Dr. Doizy, one of the founders of the *Comité*, given before the President of the Republic at the Sorbonne:

"The occasion is auspicious for the accomplishment of great things. The old proverb—there is always something good in something bad—will still be true if we awake to the situation which confronts us and strive after the good. The war has created a situation so unique that our resuscitated areas may well serve as the finest sort of object lesson in working out the highest conquests of hygiene. In years to be we shall measure the results attained, and then our devastated lands may console themselves for having suffered so much; for their past sacrifices will have served the entire Nation, since surely the Nation,

struck with the example set there, will not hesitate to adopt universally the same measures which will help to save France from the slow decay which our statisticians are forecasting."

In addition, the present ministers have promised that the Government will vouchsafe a full measure of support to this work, undertaken in the name of the safety and happiness of the French people. This is our most earnest wish and belief.



THE HISTORY OF THE BREAKING OF A BAD AND PERSISTENT HABIT

By J. MACE ANDRESS, *Head of the Department of Psychology,
Boston Normal School*

Textbooks on psychology devote much space to a discussion of habit, and current writings on hygiene pay particular attention to the desirability and necessity of forming health habits; yet few of these text-books or writings seem to be based on the actual histories of habits formed. It is indisputable that few of us know just how and with what infinite patience bad habits have been broken and desirable ones established. Probably in most cases we make many futile attempts before we meet with lasting success. The details of these adventures—the unexpected occurrences, the disasters, the various means resorted to in attempting to gain our ends—all these are forgotten or are so hazy and confused that ordinarily we have no accurate conception of the difficulties encountered and how they were overcome. Students of psychology relying on these hazy and misleading experiences and the text-book are therefore likely to believe that habits are formed with ease (some of them of course are) and that bad habits may be broken simply by presenting to their pupils an idea of the habit to be formed along with suitable motives.

To give my beginning pupils in psychology a more intimate, accurate and practical knowledge of habit formation than is to be gained by the usual methods of teaching the subject I have asked each one to select some problem in habit formation. Among the habits proposed were several relating to health such as cleaning the teeth, correct posture, proper mastication of food, getting sufficient sleep, walking a certain distance each day, etc. Each pupil was asked to form some habit which she believed she ought to form for her own good. The motive under such conditions might be regarded as particularly appealing—the desire to form a habit worth while and at the same time to satisfy the requirements of the course in psychology. It should also be added that credit for the work was to be given whether the habit was really formed or not provided that the pupil could show that earnest effort was put forth and the entire experience recorded daily and written up. The time allowed for such a problem was practically unlimited. Every pupil as a result of this experience would finally become personally familiar with the history of at

least one habit. I have found this method exceedingly valuable because it shows the prospective teacher as nothing else will the difficulty of really forming a habit of the simplest nature under most favorable conditions. It dispels a common illusion on the part of the beginning student of psychology that the teacher may get pupils to form a habit simply by talking to them about the need of forming the habit.

Among my pupils was one who resolved to break herself of the very bad habit of putting her fingers in her mouth. She was a girl of average ability and knew all the principal reasons, hygienic, social and otherwise, which made this particular habit undesirable. Many times during her life she had made unsuccessful attempts to rid herself of this habit, and several times during this experiment, in spite of her earnest desire to succeed, she seriously doubted her ability to break the habit. Finally after many weary weeks of practice this habit, which at times seemed like Banquo's ghost because "it would not down," surrendered. The complete story is reproduced here in the hope that it may give teachers a better insight into the difficulties of breaking a bad and persistent habit, even when the desires of the pupil are completely enlisted. May it also give the teacher some sympathy with the pupil who seems unaccountably slow!

The story runs as follows:

"I, M... M..., do hereby resolve to keep my fingers out of my mouth at all times.

"On January 20, 1919, I made the above resolution, which at first reading may sound very simple and easy, but which under the circumstances I found to be a very difficult thing to do.

"When I was a very little girl, I acquired the very bad habit of biting my finger nails. My mother and my grammar school teachers tried constantly to break me of this habit, but all their efforts seemed in vain. When I went to high school, however, I began to feel ashamed of the looks of my hands, so by the aid and encouragement of my fellow students and of my hygiene teacher, I was finally able to let my nails grow. The tendency to put my fingers in my mouth remained, however, and so on January 20, I resolved to get rid of this undesirable habit which remained. This was a huge task, as I later found out, for there was hardly a moment during the day that I didn't have my fingers in my mouth. If I didn't have something in my hands, or if I wasn't doing something with them, my fingers were sure to be in my mouth. If I was writing with my right hand my left was sure to

be found there, if I sat down to study, the first position I invariably took was one where I was sure to have my fingers in my mouth.

"The first week that I tried to stop it, I succeeded fairly well, because the idea was new, and my classmates and my family reminded me of the new habit to be formed every time they saw me with my fingers in my mouth. Soon the novelty wore off, and I and almost everyone else forgot about my resolution. My mother continued to remind me about it whenever I was at home, but while I was in school I had nobody to do this for me so the habit was almost entirely forgotten. Once in a while I remembered about it, and would start the day with a determined effort to form the new habit, and usually I would do it for that day, but it was forgotten on the following days.

"The week of February 7 was examination week, and during that time I actually lived with my hands in my mouth. The thought of a new habit to be formed never entered my mind, and for many days afterwards I forgot entirely about it. But I was reminded of it again and I decided to start over again with a more determined effort, for I really wanted to form the habit, and besides I hated to think that I was beaten. I once heard one of my high school friends say that anyone who couldn't form a desirable habit or break a bad habit had no strength of character. Well, I didn't want this said of me, so I made every effort to begin anew, and found that I was successful for another short period. Three days at a time seemed to be the longest that I could keep my hands from my mouth. I again appealed to my classmates for help, and asked them to tell me whenever they saw me with my hands in my mouth, but this didn't seem to help much because I no sooner had them out of my mouth than they were in again. It was evident that I was not concentrating on the habit, and that I must find some method to make me do this if I was to succeed. Members of my family chided me and told me how awkward and silly I looked when I had my fingers in my mouth, but even this and constant reminders about influenza germs that might be on my hands failed to move me in the right direction. I became discouraged over the state of affairs and had decided that it was an impossible habit to form.

"Then one day my aunt who is a nurse visited us and in the course of the conversation, my mother seeing my hands in their usual position, told her about the habit I was trying to form. She was greatly interested, and agreed that it was a difficult thing to do, but she also said it was a desirable one. We talked

it over for a long time, and finally we made this agreement. For every day I was able to keep my fingers out of my mouth she was to give me five cents, and if I was unable to do it I was to give her five cents for every offense. Two weeks later she came to see how I was progressing, and she was well paid for her visit, for I had to give her sixty cents. It seemed strange that I was unable to perform the habit after having been given such an incentive, but I think this was due to the fact that my aunt was not at hand to constantly remind me of the agreement I had made. We both realized that I couldn't keep this up (for I'd soon be bankrupt) and I also felt that I could use sixty cents to better advantage, so we decided that I must do something else. My aunt was very serious about it, and finally she said, 'If you don't bite your nails, what do you do when you put your fingers in your mouth?'

" 'Well, I said, 'I don't bite them off but I keep chewing them.' 'Then why not file your nails so short that you can't chew them?' she said. But if there was one thing I liked to have it was long finger nails, because it was such a hard job to stop biting them that I liked to have them grow very long, as an indication that I could let them grow if I wanted to. I felt that I couldn't carry out this suggestion so she told me to put something under my nails, something I would not like the taste of. I decided to use nail white under them. This worked all right for a while. I didn't like the taste of the nail white, but neither did I like the looks of my hands, for nail white under very long nails made them look very conspicuous and as I did not have time to manicure them every day it was impossible to keep them looking neatly. Meanwhile I was paying out fifteen and twenty cents every week. Finally I decided that I must either sacrifice my long nails or sacrifice my habit formation, and also my pocket money and my carfare.

"The following week, instead of giving my usual contribution to my aunt, I took the money and went to a manicurist and had her file my nails very short. My fingers had such a queer unprotected feeling that I did not put them in my mouth for several days, and I also took pride in the way they looked, and tried to keep them so. I found that it was much easier for me to keep my nails polished, and neat looking with nail white when they were short, so I used to get them manicured at least once a week. I learned that if I didn't get them done I neglected to do it at home, so after having them manicured it was a very easy matter to keep them in good condition. Sometimes if I was especially

nervous about something I would put them in my mouth again regardless of the manicure. Soon I was able to manicure them at home without taking much time, so every night before I retired I filed them so as to keep them short and kept a very high polish on them. Thus by forming the habit of daily manicuring my nails, I was able to keep my hands away from my mouth. Now I hardly ever attempt to put them into my mouth. I seem to have forgotten almost entirely about the old habit.

"My aunt thinks I have won a great victory, and I heartily agree with her, for I don't think I ever did a more difficult thing in my life.

GENERAL CONCLUSIONS

1. In the formation of a new habit, success comes at the very first because the idea is a new one and is interesting.
2. After the novelty wears off failures appear.
3. There must be long continued practice.
4. Attention must accompany the repetition. When I did not concentrate on the formation of the habit I was not successful.
5. If the habit is interfered with for one day it is more difficult to go back to it again. If I could go for three days without putting my hands in my mouth and then did put them in the next day, I was certain to do it the following day.
6. In order to form a habit one must have a desire to do so. If I really hadn't wished to form the habit I believe I would have given it up as impossible.
7. Determination to form the habit made me successful at various times.
8. The physical condition is likely to affect the formation of a habit. When I was very nervous (examination week) I was entirely unsuccessful.

The emotions play an important part in the formation of a habit. When I was unable to succeed I became very downhearted and discouraged and seemed unable to continue; when I was successful I had a feeling of pleasure and wished to repeat my successes."

This simple story ought to be of great value to teachers who are trying courageously to form health habits. It is evident from the many stories similar to this in my possession that health habits cannot be expected to be acquired except through intensive training. This requires in most cases not only the personal encouragement and inspiration of the teacher, the assistance of fellow pupils and vigorous practice at school, but also the hearty co-operation of the parents.

As in the case of geometry there is no royal road to health habits.



SCHOOLHOUSE STANDARDIZATION

Résumé of an address by FRANK IRVING COOPER, *Boston*

At the June meeting of the National Education Association, Section in School Hygiene, Frank Irving Cooper, the Boston architect, Chairman of the Committee on Schoolhouse Standardization and Planning, discussed some of the problems in hygiene involved in schoolhouse construction. It was a story of unscientific, uncoördinated work, of school buildings planned without much knowledge of principles, and developed in each section without much reference to the experience of other sections.

Mr. Cooper spoke of the important relationships of the school building to the health of the pupil. He called attention to the necessity of clean, airy, well lighted structures, which will create an atmosphere of healthfulness and cheer, which must influence every thought and word of the child in this, the formative period of his life.

In illustration of some of the conditions that exist, Mr. Cooper gave the figures secured by his committee with reference to the lighting of existing school rooms. Great irregularities have been found in this vital feature; rooms presenting intense lighting near the windows and comparative darkness back in the room. Room A has on a rainy day an illumination of 17.5 foot candles near the window and 1.2, at a remote desk which is in use. A minimum standard has been adopted by illuminating engineers for lighting of such rooms, namely 6-foot candles, and it is evident that this room falls within the danger limit. Room E on a clear day has 10-foot candles near the window and 2.3 at a distant desk, while still another room proved to have only half a candle at the remote desk on a rainy day. Such conditions are ruinous to the child's eyesight, yet they have heretofore passed unchallenged if not unnoticed.

A very striking discrepancy was pointed out by Mr. Cooper in the lack of uniformity in ventilation methods. Here there is the relief that skilled men are planning, yet the various states are wide apart in their legal requirements and farther apart in the actual provision made. It is true that the states that have paid attention to the matter at all have adopted practically the same requirement for the number of cubic feet of air furnished,

but no consideration has been paid to the efficiency of different systems of ventilation, and apparently little to ensure construction up to the standard. Massachusetts sets the pace, and the duct area—which may be taken for a general measure of the amount of ventilation—is from 3 to 6 percent of the total floor area. In discussing this matter Mr. Cooper complimented the Massachusetts building inspectors, and commented on the low duct areas in most states which must fail to provide for the children the life-giving, fresh air that they are entitled to in their many hours at school.

“In no department of the school building,” said Mr. Cooper, in touching upon another general lack of hygienic consideration in school buildings, “is there less uniformity than in that pertaining to sanitation. Most large cities have regulations, but the larger political divisions, the states, have not realized the terrible significance of the lack of direct control over adequate arrangements for the privacy of the school children.” There are but five states that have any regulations with reference to the number of toilets for a school building, and only one that considers the space requirements. The number of toilets is fairly constant in the states that have any regulation, although Wisconsin requires one-fifth less toilets for the boys than do the other states. Massachusetts alone has gone into the matter scientifically, and suited its regulations to the mathematics of the matter.

Mr. Cooper spoke further concerning the surprising lack of rooms providing modern hygienic conditions. In 122 of the school buildings tabulated by his committee, 16 have no provision for special rooms for women teachers, emergency rooms, rooms for physicians; 40 buildings have a room for the teachers, but lack the other requirements, and only 18 school buildings have a room for the school physician.

In closing Mr. Cooper emphasized the need that exists for a new specialist in the form of a consulting school architect, who could prove to be a clearing house of information concerning school buildings, and could supplement the skill of the local architect with the technical skill of an expert on the requirements of school construction.

PUBLICATIONS RECEIVED

AN EDUCATIONAL STUDY OF ALABAMA. Bulletin No. 41, 1919, of the U. S. Bureau of Education. Washington, Government Printing Office, 1919. 522 pp. Ill.

This exhaustive survey was made under the direction of Dr. P. P. Claxton at the request of the Alabama Survey Commission, created by act of the Alabama legislature. Among the sectional chapters are the following: County supervision of schools; Rural schools; Negro education; Agricultural schools; City schools; Institutions for abnormals; Illiteracy; Health and physical education; Certification of teachers; Preparation of teachers in the normal schools; Higher education; State support of higher education; etc., etc.

Of special interest is the section dealing with health and physical education. Early in the study it was found that practically no work along these lines was being done in the rural sections of the State. Accordingly the surveyors went into the field to gather data at first hand. Two methods were followed: one was to have approximately 150 children examined in each county and the other was to select a typical county and conduct more intensive examinations. One-third of the children examined were to be colored. From the first method, it was found upon examination that between 50% and 60% had diseased tonsils; between 40% and 50%, had decayed teeth; 20%—30% were undernourished; 20%—30% were hookworm suspects; and that 20%—30% had enlarged glands.

The report points out one of the great obstacles to efficient health work as being the lack of coördination between boards of health and of education, neither agency having its proper duties clearly defined. The Birmingham plan of coördination is quoted in full as being a sane and excellent working plan. Briefly, the Birmingham system gives the board of health jurisdiction over acute communicable diseases, endemic, intestinal and social diseases. All other phases of health supervision is left to the school authorities.

The commission recommends (1) that the Birmingham plan be adopted as fixing the respective duties of health and education authorities; (2) that every county board of education employ a health director on a 12-month basis and furnish him with an automobile with its upkeep; (3) that the State department of education employ a state director of health education; that provisions be made for continuous physical education for all children between 6 and 18 years of age in the state; that adequate provisions for the training of teachers of physical training be made.

PRIVATE ENDOWMENT AND PUBLIC EDUCATION.
A Report of the Use of the Handley Fund, Winchester,
Virginia. General Education Board, New York City. 1919.
77 pp. Ill.

The Handley Fund, amounting to nearly two million dollars, was bequeathed to the town of Winchester, Va., by Judge John Handley, who stipulated in his will that the income should be expended for the erection of school houses and the education of the poor. The courts interpreted the bequest as applicable to the maintenance as well as the construction of schools. By act of the Virginia Legislature, a Board of Trustees was created to administer the fund. One of the first steps taken by the trustees was an invitation extended to the General Education Board to make a survey of Winchester and suggest a plan of educational development. This volume is the result of the General Education Board's study of the situation and its needs. The total population of the town is 6,469, and the annual income from the fund should be approximately \$59,000. It is recommended in the Report that "the wisest use the Handley Trustees can make of the funds at their disposal is to co-operate with the people of Winchester in establishing a system of superior public schools," but that it would be little short of a public calamity to relieve the tax-payers of their just and proper duties in maintaining a public school system. Hence, it is recommended that no part of the income from the fund be available unless the Common Council shall have appropriated from the tax money for school purposes at least the sum of \$15,000.

An interesting, not to say unique, situation appears to confront the people of this Southern city, and the possibilities of working out an elaborate and superior system of schools are very great indeed.



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DO WE WANT HYGIENE?

By the EDITOR of *The American Journal of School Hygiene*

When Pestalozzi, the great Swiss, grew old and the shadows of life's late afternoon flickered ominously about him, he withdrew into his chamber and wrote his *Schwannengesang*, or "Swan-song." It meant that his end was drawing near. The application of this reference shall appear in due time as we proceed in the following pages.

It is now exactly three years since the editor of this *Journal* made his venture into the field of educational journalism. In January, 1917, the first number of *The American Journal of School Hygiene* made its bow to an unexpecting world. Some of the country's great leaders in educational hygiene and general public school health work were either interviewed or corresponded with, and their advice noted. Without a single exception the hygienists whom we consulted as to the advisability of founding a publication which should be devoted to health work in the schools were much impressed with the proposition, and were so good as to actually wish us well and to offer to help us in any way in which they were able. Convinced by these tokens of good will as well as by our own knowledge of the great need which such a magazine could fill, we launched our tiny hygiene ship upon what we supposed to be a smooth sea whereon it might sail majestically and calmly. The bark is still sailing, but as to the majesty and calm of its progress we have nothing favorable to say.

This paper, written under the spell of an apprehensive mood which is likely to be a common mood among educational jour-

nalists if not among all persons interested in education—is to be in the nature of a confession of faith, commingled thickly with an impression of skepticism. If the latter viewpoint appears all too often to be the ruling one, pray pardon it and set it down to the dominant mood of the moment.

In the first place, be it said that our greatest efforts during the past year have been directed toward building up a reasonable subscription list. We have not been motivated by the slightest desire to “make money” through advertisements. (But of this, more later.) Our sole desire has been to put in the hands of educators some information and some suggestions which they could make use of in promoting the health and physical soundness of boys and girls in the public schools. To this end we have from time to time all but flooded the mails with sample copies of the *Journal* sent broadcast over these 48 United States. At some time or other a copy, with the inevitable and suggestive subscription blank enclosed, and often accompanied by a personal letter, has been despatched to every college and every university of any standing in this Country; to every one of the 200 state normal schools, and to the greater part of the city or private training schools for teachers; to every public library in towns having a population which seemed to warrant interest in such a subject as we represent; to everyone of the state departments of education; to every city department of education in cities of 50,000 and upwards of population; to all the members of the American School Hygiene Association; and to any other official or department or individual whom we had any reason to suspect as being interested in health work. Besides this personal effort on our own part, a great many other educational and other journals have been kind enough to insert in their own columns notices and reviews of us; we have also listed ourselves in every subscription agency of importance in the Country, and have been regularly reviewed in the *Current Educational Publications* which are released and sent to all the schools and school officials every month by the Department of the Interior at Washington. In addition to this, we have at considerable personal sacrifice been in attendance at several educational association meetings in order to “exhibit” ourselves and our product to the attendant multitudes (?).

And with what result? At the present writing, the thirteenth day of November, our subscription list, by which we mean our total number of *paid* subscribers, has reached the

grand and dazzling total of one hundred and thirteen! One hundred and thirteen people or institutions are supporting our journalistic efforts! No wonder that we feel ourselves literally to be a "*vox clamantis in deserto!*" No wonder that we are in fancy already singing our *Schwannengesang!*

Surely these one hundred and thirteen souls or collections of souls will be interested to learn how they are distributed, who they are, where they are. For their information and for the information of all others to whom such knowledge may be worth the having, we depose the following: A dozen state normal schools scattered from California to Massachusetts, and from Wisconsin to Tennessee, are there. A dozen universities likewise scattered and a half-dozen state departments of education; a half-dozen public libraries; a few "leagues to prevent hygiene from entering the schools" (sic!); a few more city or town superintendents of schools; and, most of all, something under a score of foreign subscribers (England, France, Italy, Canada, etc.)—such is our subscription list! Poor *Hygeia!* Gentle Goddess of Health! Truly the worshippers at thy shrine are few and far between! Thy cult is moth-eaten and thy temple coated with dust!

But we have not rested after all these attempts to replenish our exchequer by the subscription pittances. We knew—everybody knows—that what keeps an educational or any other journal afloat is the funds received from advertisers who make habitual use of its columns. Cognizant of this we began also three years ago to build up a list of advertisers whose textbooks or hygienic or sanitary apparatus and appliances might logically be set forth in our *Journal*. We have wasted nearly enough money in postage to add a score of pages to this rather thin issue which you hold in your hands. And with what results? Behold! Thus far (on this same thirteenth day of November) we have received over the entire period of three years the colossal sum of one hundred and seven dollars from advertising! "Foolish one!" they exclaim when being importuned to give us a four-dollar advertisement, "Wherefore should we advertise in a publication which has no readers?" And then we sit down to seek solace in the philosophy of Marcus Aurelius—and usually find it. But such is the case. We cannot get advertisers to support us until we can get a creditable subscription list. We cannot get the latter until we can get the money from advertisers to make it possible for us to print a larger, more attractive quarterly so that those who should be

interested to subscribe will be compelled away from the line of least resistance. And so we get it, going and coming. Meantime, we *have* taken in the hundred-odd dollars mentioned. For the most part, these welcome dollars have been cast upon the altar of Hygeia by local storemen who sympathized somewhat with a local undertaking and silently laid their sacrifice upon the altar, often without so much as a sigh!

Naturally we have attempted chiefly to interest the larger publishing houses to make use of our cover pages. But the larger houses very naturally place their advertising where it will bring results in proportion to its cost. That is one of the most elementary laws of good business. Still, it should be said in passing that there are some attenuating circumstances in our case which should ethically and morally at least have interested the large houses to help us out. For example, during my own incumbency of the department of psychology and education in the institution to which I have the honor of belonging, my department alone has purchase dollars and dollars worth of books and supplies from each of several large houses. It would seem that occasional turn-about would be but fair play. And yet from one of the *very* largest and most prosperous of them all we cannot even get the favor of a reply to our letters of importuning!

There is, however, one favor which all houses are pleased to show us. Whenever a new book which has any bearing whatever upon our class of readers is published by them, we are honored by receiving a review copy, with the invitation that we have something to say about it in our columns! Naturally this fills up our sometimes otherwise empty columns, but it fails to fill the exchequer, and we are sufficiently mundane in our motives and sense of values to rebel silently. It is true, of course, that these specimen volumes help greatly to increase the imposingness of our own private library and due credit should therefore be vouchsafed the publishers.

The postal authorities have also contributed their share of difficulties and embarrassments to our efforts. We have tried on three separate occasions to get our publication entered as second class mail matter, to the end that it might be more cheaply sent through the mails, and hence that we might be able to send out a larger number of sample copies with each issue. But upon each separate occasion we have been refused admittance on the grounds that our sample copies were out of all proportion to our paid subscription copies, and that hence

apparently we were "mailing publications designed primarily as *free material!*" (!) If we only *could* conduct free propaganda on behalf of school health work, how happily we should embrace the opportunity! The practical result to us of this refusal on the part of the postal authorities to admit our publication to second-class rates has been that our annual cost of mailing 500 copies four times a year amounts to about \$40. If we enjoyed second-class rates the bill would be automatically reduced to somewhere in the neighborhood of \$3., which would represent a tremendous economy for us. We have been tempted on more than one occasion to print precisely the one hundred and thirteen copies paid for, and then apply for admission to second-class rates on the basis of a 100% paid subscription list, with no sample copies. But, unfortunately there is a sort of understanding with the advertisers whom we *do* have that each issue shall represent no less than 500 copies. And so again we get it going or coming.

The general pecuniary result to us of our journalistic ventures is obviously a considerable deficit. There is no capital behind the enterprise save that represented by the salary check of a teacher. Perhaps no more need be said.

During the war while printing costs were high and while every ounce of energy was being devoted to winning the war we told ourselves that we should not expect any great boom in such journalism as ours. But we consoled ourselves with the hope that after the war was won the pendulum would swing back to something like normal times again, and that there would be a greatly increased respect for hygiene in childhood. Behold, the war ended! And behold two days ago the celebration of the first anniversary of the signing of the Armistice. And behold, incidentally, our one hundred and thirteen subscribers, which represents an increase of twenty-three subscribers over and above the number which we possessed one year ago today!

And yet if the great war demonstrated anything besides the propriety of the rule of right over might, it was that the physical condition of the youth of our land is anything but what it should be. This has been a favorite theme of students of education ever since the First Report of the Provost Marshal General to the Secretary of War, which revealed the fact that approximately a third of the young men drafted could not be accepted as soldiers because their physical condition was not such as to warrant their enduring the hardships of trench war-

fare. Among other journals our own has sounded the note of reconstruction along this vitally important line. Never before was there so much *talk* about the importance of hygiene and health work in the schools; never before were legislatures passing so many *permissive* laws with reference to school medical inspection, school nursing, school clinics, etc., etc. But where is all this talk leading to? If the editor of the only journal published in the New World devoted exclusively to this phase of education is any judge, he can but conclude that we most positively *do not want hygiene*.

Here is another proof that we do not. In all the three years during which we have been publishing, *we have received but three unsolicited manuscripts*. What is the reason? Is it that school men and school teachers are *trying out* nothing which they can write to us about, or is it that they are totally uninterested in this branch of education? Or is there some other explanation? The result is, in our own case, that we are forced personally to write practically everything that appears in our columns, with the frequent assistance of one or two of the contributing editors who anon take pity on us and help us out. The editor has scoured the entire field in order to find something to write about. He has in several cases been compelled to translate something from a French or Italian periodical like his own in order to make up his quarterly number; and this notwithstanding that the *Journal* proclaims on its title page the fact that it is a publication devoted to the interests of school hygiene and general health work in the public schools of the *United States*. Frequently too, we have been compelled to reprint something relevant from other general educational periodicals in our own Country—which necessity has frequently been reciprocated by those others who have on several occasions seen fit to copy or “reprint” articles appearing originally in our own columns. It should be said in justice to us (for we need all the justice we can get) that several periodicals in foreign languages have reprinted articles from our *Journal*. The inference from this fact and from many other circumstances too numerous to mention, is that foreign lands are more concerned about hygiene than is America—which is quite generally held to be true.

We have recently looked over our tables of contents for the past three years, and have been compelled to smile in spite of ourselves at the sort of material we have been compelled to run. Not that it was not all valuable but that it possessed little value

which was very *practical*. Our ideal has been to produce a publication which teachers and students of education would find valuable and practical: how far short of our ideal we have fallen for the very simple reason that *there is none to write on such practical phases of hygiene!* We think that a rational arrangement of our publication would be to print one experimental article in each issue and three or four papers which would represent the practical possibilities of hygiene, or what is being done by various cities and towns and state departments, etc. in behalf of educational hygiene generally. But we cannot unfortunately do so. We can neither afford the necessary number of pages, nor can we find the articles to print!

When March comes around we start out each year boldly with an initial number somewhere in the neighborhood of 36 to 52 pages—surely small enough—in the hope that its *ponderousness* will secure favorable attention on the part of prospective subscribers and win for us added names upon the thin subscription list! Vain hope! We use up 75% of our total assets for March, and have almost nothing left for June and September, and by the time December comes—just note the number of pages in *this* December number! We are almost ashamed to offer it to our readers, and yet it represents a good many dollars of personal sacrifice on our part.

Our faith was large: it is dwindling. Do we really *want* hygiene? Where are our training schools? Do they teach it at all? Where are our universities? Where are our state departments? Where are our superintendents of schools? Is there no *practical* hygiene taught in this country? And is none practiced? The editor desires to know. Can you help him?

Finally, for the mood is wearing off in spite of the gloom surrounding it let us say that this is *not* our Swan-song. We do not propose to die yet! But we must importune you, our few readers, to fight for us if we are to survive. Write for us, canvass for us, speak a good word for us, renew your allegiance to us by another check for \$2.00. It may save our expiring breath. For we *dare* not die: we have not sufficient funds to provide decent burial! The secret is out!

A PLEA FOR THE OPEN-AIR SCHOOL

By BERRY LOUDUN, Washington, D. C.

"Since the War" has become the keynote of public school educational conference and writings. It is, however, not trite, because of incessant formulary usage. It calls to mind always that fateful *one-third* of our boys just from school tutelage who were turned over to us fathers and mothers—and to the Nation as its next-line of fathers and mothers and its civilization's honor-guard. *One-third* found defective in body! It is an incredible thing that out of the numberless meetings of educators during the years that culminated in that *one-third*, all the squander of moneys and the scheduled talks and the goings to and fro to convene—that out of it all the net results should be compromised by and in that appalling *one-third*.

Is it that educators spend too much time in educational twaddle? Do these innumerable meetings, these periodical dress parades of the teaching forces of the United States—do these mean nothing but an educational shibboleth? Has *education* in its proper sense a meaning too big for the ordinary educational apprehension?

It is the signal moment now to turn square about in our educational procedure and endeavor to strike a vein that will be vital to a national life. I wonder if Open-Air Education be not in large measure the answer to that educational *cul de sac* through which in the form of 281,524 public schoolhouses we have been guiding our boys and girls?

Open-air education was tried out first upon the sickly childhood of a people. The childhood that from cradle to grave goes food-hungry, blood-famined, and in its slums is progenitor to the successive generations that keep alive those child-filled slums of hunger—it was for them that this form of education was first entered upon. Just a handful of such, plucked from a great city's poverties, were set down in a pine forest. Out of the city's dolor and fetid back ways and away from their piteous care of the littler children under foot whom they must child-mother, these lean children with stringy muscles and joyless hearts were set down amid the pines to breathe their balsamic breath and to dance gay child dances and to play close to the earth of the crickets and the alluring bugs that burrow and

chirp—and to be fed! To be full-fed, from a breakfast of soup and bread and butter, through five meals daily! They could eat without stint jam and pudding and meat and drink pure milk and cocoa.

"And," said John Eldon Gorst, after a visit to that Forest School, "what struck me most was the air of extraordinary joyfulness which permeated the whole establishment down to the smallest and poorest child."

It paid *so*! Compound interest compounded daily! It paid *so incalculably*!

The educators went a-calling to see, and forthwith there was born a new day for sickly school children. House-top and tent, ferry-boat and the open—it was a rare race the cities ran, culling out their delicate children from schoolrooms air-starved and dry and super-hot. But they left the healthy children in these same schoolrooms that were weakening and killing the sickly children.

Then, one spring, came a happy idea to the educators, all a-gog in the pleasurable work of saving the school children. Someone suggested that if fresh air were so good for the withering portion of the children, why should it not be just as good for the blossoming portion of childhood before wither and blight came upon them?

And thus the child came into his own inalienable rights to all the clean air needed for all the cells of his lungs to drink up and for his blood to find sparkles in and his flesh to grow wholesomely as child flesh should grow—and into his rights of happiness.

Open-air education is a charter right attendant upon being born. To shut away in plaster walls that are a prison, however adorned and painted, when the walls of the green-leaved out-of-doors is there? Or a snow-velvet world of glory? Oh, it is the crime of crimes to house in during the goldenest hours of daytime in the childhood of this earthly life our "twenty million or more" into an educational strait-jacket!

It may cost generously for a special open-air building; it may cost less for a rehabilitation of existent schoolhouses. The wave of intellectual reaction against the multi-storied and many-stairwayed schoolhouses—which is already resulting in setting seemingly, one-storied schoolhouses in the city midsts—is a phase of civic revolt against the educational mal-handling of the city's best social asset, the children born of society, and to it and for it! One-story! Open-air!

And it may cost more in the tearing down and carting away of the huge schoolhouses—monuments to a measureless scholastic ignorance of the principle that *life* is education. But change is needed. Yesterday's education, squeezing and numbing and atrophying *life* to thumb-rule of hot, dead-air schoolrooms and the shut-in existence of the school population of the Land, is a Golgotha of incredible pain, of incredible loss!

Or, it may cost very little! A tent in a corner of the outskirts, where birds fly near and the winds winnow little hearts of heaviness, little brains of fog! A roof, in a swarm of tenements;—an “out-of-doors” in a city park! There's Central Park, for instance. What a Heaven-for-children! Open air classes might be held there indeed. And there's the park in Washington, down on and wrapped around the Speedway, where there are squares of trellised red and white climbing roses in summer time, and where Japanese cherry trees glimmer a-bloom by the lake, like bride ladies softly waiting. What a Heaven-for-children there, whether for tent-school, or for pavilion-from-the-rain school; or just all out-of-doors for classrooms.

And it is the most practical thing in the world!



TOPCHIDER CAMP

By CORNELIA R. TROWBRIDGE, Belgrade, Serbia

On the outskirts of Belgrade, in barracks used formerly for a prison, 150 boys were found last July, dirty, ill-clad, undernourished, crowded together in dormitories which had only 40 beds, infested with vermin, the sick and well huddled together, with no oversight but that of helpless minor officials and ignorant guards. They were orphans from all parts of Jugo-Slavia, collected in Belgrade to be distributed as permanent homes could be found for them. Through someone's inefficiency or neglect their plight was a cruel and shocking one. One of those Scottish women who have done so much for Serbia these last five years discovered their situation and reported it to the Child Welfare Committee, an organization of British, Americans and Serbs. The authorities responsible in the matter sent most of the children elsewhere in all haste. 30, however, were left behind and more were coming in. Some action must be taken.

A camp in the park at Topchider, just across the road from the barracks, seemed the best means of meeting the emergency; but days went by and no one was found to take it in hand. Then by good fortune the story reached the ears of a Californian, Mrs. Leavitt, newly arrived in Belgrade to join the unit of the Serbian Relief Committee. She had been through the San Francisco earthquake and had learned there how to accomplish the impossible. For everyone said it was impossible to get a camp set up in time to be of use. The summer was half over, it was difficult to get equipment and labor and all things Serbian move at the rate of ox-cart travels. But the daughter of San Francisco, who cared for 25 homeless boys in a backyard of Oakland for three months, volunteered to see what could be done. The Child Welfare Committee, the British Supply Commission, and the American Red Cross and Food Administration stood by her and within ten days arrangements were so far completed that 30 excited and grateful youngsters were brought over from the barracks one evening and put to bed in two airy tents under warm blankets.

A dozen tents are now grouped under the tall trees of the park, a long stone's throw back from the road on which all day soldiers march by, singing, ox-carts make their slow way

into Belgrade and gaily-clad peasants pass with baskets of farm produce hung from their shoulders. The war left its traces here. Between the trees run the zigzag lines of trenches and there are huge shell holes from the Austrian bombardment and the ruins of a marble monument which they wantonly destroyed after gaining possession of Topchider. Besides the two sleeping tents there is a big mess tent and one for a hospital, happily not always occupied but useful during the doctor's daily visits and for the nurse's treatment of minor ailments. The director's sleeping quarters, the common living room and the supplies fill another large tent and there are smaller ones for the rest of the personnel. Not to be omitted is the bath tent, flanked by three great cauldrons. Here all new-comers are put into tubs and thoroughly scrubbed. Great is the interest of the other boys in seeing that the ceremony is properly performed. They bring water to fill the cauldrons and keep the fires going until it is sufficiently heated and it takes a watchful eye to see that they do not overcrowd into the tent and form a ring of spectators around the tubs. They have set up a strict standard of personal cleanliness and will not admit the new arrivals to their rank and fellowship until they emerge from the bath tent, scrubbed and shining and outfitted with new clothing. And the ragged, dirty little fellows who are brought to the camp come out of the tent happy to be clean and touchingly grateful for the welcoming care given them.

The personnel of the camp has been supplied by the Serbian Relief Committee and the Committee is also meeting the running expenses. There are three other Americans besides Mrs. Leavitt, one of them a Red Cross nurse, a young Serbian, for four years a student in England, who acts as interpreter and lends a most willing hand and a clear head in every situation that arises, three light-hearted Serbian girls who cook and wash and make merry all day long in the kitchen shed, and half a dozen soldiers to work about the camp by day and to guard it, as they do most faithfully, by night.

Until better equipment can be secured the boys have to go over to the barracks for their meals, but the food there is none too appetizing and most of the boys are thin and ill-nourished. So at ten o'clock each one has a cup of cocoa and a cracker. They all say "Fala, Sestro—Thank you, Sister" and after draining the last drops wash their own cups. Then follows gymnastic drill given by the interpreter, who was a Boy Scout in England, and the daily roll call. In the afternoon there

are crackers and jam all round, the jam being licked off with true Serbian joy in *slatko*. For the rest of the day they bring water, cut and stack wood, collect stones to make paths, gather flowers to deck the tents, crowd around any automobiles that drive up, climb trees for walnuts and tumble about on the grass. It has not been possible to have them go to school—the camp is so far out of the city and its existence limited of necessity to so few weeks. But the eager young things are always happy and busy. They are having a doctor's supervision and watchful care from the trained nurse. Old sores are being healed, pinched faces are rounding out, the timid and the listless boys are brightening up. They are all learning to play together peaceably, to recognize each other's rights, to submit to discipline and respect authority.

Perhaps the happiest hour of the day comes at its close. In gay Serbian fashion the boys break into singing as they troop back from supper, and sweet it is to hear their young voices. They frolic about the camp for a while and then the lights are lit in the sleeping tents and with much chatter and laughter and occasional childish quarrels they go to bed. Some of the staff goes to say *Laku noch* and wish them pleasant sleep, as the Serbian phrase runs, there is a final chorus of "Thank you, Sister. *Laku noch*" and gradually they quiet down.

At this writing, September 10th, 140 boys, from 7 to 15 years old have been taken into the camp. We can only guess what they have endured of privation and ill-treatment during and since the war. They have proved most responsive to kindness and to just and firm discipline. They are both likable and lovable. What will be done with this group when cold weather makes tent life no longer possible, and for the thousands of others like them for whom not even temporary care has yet been provided is the problem which the Belgrade unit of the Serbian Relief Committee is trying to help with. The Topchider experiment is another demonstration to those who have seen its results that the orphan boys of Serbia are well worth caring for, both for their own sake and for that of Serbia's future.

NOTE:—The above letter from Miss Trowbridge, who is working in Serbia under the auspices of the Serbian Relief Committee of America, with headquarters at 70 Fifth Avenue, was sent us by the Associate Secretary, who advises us that \$6.00 a month will insure food, clothing, and shelter for a child in Serbia. Gifts in money sent to headquarters are transmitted by cable so that relief may be instant. Contributions of clothing are repacked and shipped promptly.—Ed.

PUBLICATIONS RECEIVED

THE BLIND: THEIR CONDITION AND THE WORK BEING DONE FOR THEM IN THE UNITED STATES.

By Harry Best, Ph. D., author of *The Deaf, Etc.*, N. Y.,
Macmillan, 1919. 763 pp.

The object of this volume is to consider the condition of the blind in this Country, and the work which is being done for them. The attitude of society toward these unfortunates has been largely one of compassion and sentiment, rather than of concerted efforts to ameliorate their condition in a scientific manner. In the main there have been in the past two provisions for the blind: (1) supplying of the means of education to blind children, and (2) the more or less indiscriminate giving of alms or similar doles to such of the blind as have crossed our paths. The body of the book is divided into seven parts. Part I considers the number, present social condition and cost to the individual and to the state of those persons in our population who are sightless. Part II takes up the discussion of the possibilities of the prevention of blindness. Heredity, diseases, accidents and injuries to the eyes are considered in some detail. In Part III are enumerated and discussed such provisions as have been made by the various states in the education of blind children. This phase of the problem is treated historically from the earliest attempts at instruction in the Old World down through the most recent efforts of the American States. Part IV is concerned with the adult blind and the work which society has done and is doing in the way of teaching them to read; the best systems of raised print are examined and the general educability of the blind in the mastery of reading by its means examined. Part V deals with the material provisions that have been made for the blind. Special homes, industrial establishments, pensions and indemnifications for the loss of vision are among the topics treated under this caption. In Part VI are included surveys of private associations and public commissions and such other organizations as have been established to promote the general welfare of the blind. Part VII is in the nature of a summary of the whole.

There are at the present time in the United States 57,272 blind persons; of these about one-tenth are under 20 years of age, the great majority naturally being elderly people. The difficulty of the task of providing properly for them must be recognized as one of rare seriousness. So great, in fact, is the problem created by the blind that the author is constrained to ask whether in a well-ordered state there should be such a thing as blindness. In the past, he declares, that a certain portion of the race should be without sight has been taken more or less as a matter of course, and little thought was given to means of prevention. As a matter of fact, however, it is probable that well over one-half—perhaps nearly two-thirds—of all blindness is preventable, and, with the new light cast upon the problem by recent advances in medical research and social investigation, considerable prophylactic work has already been undertaken. *Ophthalmia Neonatorum* and *trachoma*, two of the most common causes of blindness

apart from injuries and progressive organic defects, lend themselves to simple and efficacious treatment if taken in time and properly looked to. For most of the other diseases that cause blindness we shall have to wait upon further developments in medical science. But in the matter of accidental causes there is much that can and should be done in the way of safeguarding and conserving human vision.

A HANDBOOK OF AMERICAN PRIVATE SCHOOLS.

In the *Sargent Handbooks* series. Fifth Edition, 1919-1920. Porter E. Sargent, Boston. 761 pp.

This latest edition of the *Handbook* is a worthy successor to those which have preceded it. It has come to be an annual review, not only of the private schools themselves, but also of the noteworthy movements in secondary education and its contemporary literature.

REPORT OF THE COMMISSION FOR TUBERCULOSIS, AMERICAN RED CROSS IN ITALY.

Roma, Tipografia Nazionale Bertero, 1919. 147 pp.

This report of the Commission includes three parts, the first devoted to *school hygiene*, prepared by E. A. Peterson, A. M., M. D., the second devoted to *child labor in Italy*, prepared by Ruth M. Underhill, and the third devoted to *housing in Italy*, compiled by Mildred Chadsey and Marjorie D. Johnson. In the first section of the Report a survey of the work done by the Association in behalf of school hygiene is presented. The systems of health work in operation in ten of the larger cities and also of the country districts surrounding Genoa were studied at first hand as a basis of determining in what way Italy could best be helped in this matter. The results showed in general that while there were in existence laws requiring the health inspection of all children, they were being put into practice only in the larger cities. The viewpoint held appeared to be rather that the purpose of school health work is rather to prevent the spread of contagious disease than to positively improve health conditions among the school children. In the light of the information gleaned from inspection of the system as it existed, the Association collaborated with the Italian School Hygiene Association in setting on foot a constructive program of health work in the school of Italy which is destined to be fruitful on an inestimable amount of good. Already many evidences of this are to be seen.

The second section of the *Report* is in the nature of somewhat detailed inquiries into (a) the problem of child labor in Italy, and (b) the housing conditions in the principal Italian cities.

ANALES DE INSTRUCCION PRIMARIA. Tomo XV.

An annual report of the schools of Uruguay, Montevideo.

Gregorio V. Marino, 1918. 848 pp. Ill.

THE AMERICAN JOURNAL OF SCHOOL HYGIENE

LAWRENCE AUGUSTUS AVERILL, *Editor*
WORCESTER, MASSACHUSETTS

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Edited by Lawrence Augustus Averill

with the assistance of the following contributing editors:

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LEFTHANDEDNESS AND MIRRORED WRITING

By JAMES KERR, M. A., M. D., London

A manual operation generally involves work of both hands. An inflammatory or extra sensitive condition of even an unimportant part of the left hand will be painfully obvious in almost any action or movement of the body. As a rule the chief work is done by the right hand, with the left as auxiliary; but when necessary, as for instance in the fingering of the violin player, the left can often take up highly specialized duties. It seems evident that any manual action has to be considered in its entirety, and not as consisting of separate operations done by the two hands, but as a nervous motor complex in which both are co-ordinated.

NORMAL PHYSIOLOGY

The right hand has generally a greater capacity for fine adjustments than the left, which last is then accessory. There is at present no worthy explanation of why the right hand should be so specially used, except that it is driven directly from the left side of the brain, and that in the majority of all races that side gives evidence of a higher state of functional evolution than the other.

The interpretation of sights and sounds into ideas, and the intellectual functions which control the voluntary machinery of the organism are commonly bound up with functioning of

a highly developed left cerebral hemisphere so that in normal individuals the left hand, although its motor centres are on the right side, is still driven indirectly through these right-sided cortical centres by the higher control of the left side.

This is well illustrated by a case recorded by Pitres as long ago as 1884. A man of 31, ten years after a specific infection, was seen with a comparatively recent post hemiplegic condition of the right side. There was some weakness of grasp and slight rigidity of the right hand, but whilst there was no other sign of nervous disturbance he could not write with that hand, although if asked to draw a man, a square, or a circle he readily did it. He could spell correctly, point out the letters required in a book, knew what was meant but could not set it down in script. He could write script with the left hand, and then copy it correctly with the right. This condition of motor agraphia with the right persisted after many months attempted reëducation, and is interesting as showing how particular intellectual centres of the left side of the brain, cut off from direct access to the centres for the right hand on that same side, worked through the left hand centres on the opposite side and then round again by way of vision and the visual cortex to the right hand centres on the left hemisphere.

Experiments on learning with mirror drawing, that is tracing over with a pencil a design, where the design and pencil point are only seen in a mirror, shows that practice with either hand gives considerable cross education or transfer to the other hand, demonstrating that the same central factors are being trained through either hand.

Whilst right handedness is the rule, men button their clothes in one direction, women in the opposite. The man architect who designs a kitchen is said to reverse many arrangements such as the draining board of the sink on the right when every woman wants it on the left; some women are miserable in a lefthanded house. It is evident that much of the division of labour between the hands is a matter of habit rather than physiological necessity.

DEXTRALITY

The specialized aptitude or capacity associated with the psychical phenomena of speech and reasoning so marked in the left brain is best described as dextrality. In a small pro-

portion of individuals the reverse happens, instead of the usual high functional development of the psychic qualities in the left brain it is the right side which shows this property; a consequence appears to be that the nearest motor centres, those of the left hand, become the most specially used and the right remains accessory.

There are animals which develop unilaterally, certain flat fish for instance, and animals with shells whorled in a certain direction in which, exceptionally, instances of reversal of growth direction occur; pure lefthandedness may be looked upon as an analogous condition. Sometimes human examples of lateral transposition of visceral arrangements are found, but of cases reported where there is any note of psychical function it is generally true that the individual was right handed.

A few exceptional records exists of "crossed aphasia," where a right handed person has had extensive damage to the left brain without any aphasic symptoms appearing, or on the other hand where in a right handed person left handed paralysis with rightsided brain disease (emboli) has occurred with aphasia. Some but not all of these people have been left handed by heredity, and apparently right by training, but there are at least half a dozen cases where this can be excluded, rare exceptions to the rule that dominant side of the brain corresponds to the opposite dominant hand. Associated frequently with this left-handedness is a reversal in the psychical sphere which may show itself in many other ways, and habits and customs of wearing clothing, tying knots, drawing diagrams, parting the hair and so forth, tend to present a negative image of that which is common. The bodily asymmetry in specialization is not only concerned with the hands, but affects hand and foot and other parts.

Madame Ioteyko, of Brussels, asserts that the left side of the body is most sensitive to pain by about ten per cent; on the other hand, Van Biervliet from many hundred of cases sums up that for appreciation of vision, hearing, touch and muscular sense, right handed are about ten per cent more sensitive on the right side; for left handed and ambidexters a similar condition holds on the other side. These two sets of observations are quite concordant with a functionally more developed left cerebral cortex being the usual condition. The left handed are also more frequently left footed in separate actions.

In the case of vision, other things such as refraction and acuity being equal, the right eye appears superior in visual memories and in fixation. This shows up in a crude way in the results of medical inspection where acuity is generally noted as best in the right eyes, the records being probably more due to mental than to ocular conditions. Dextrality then is a psychical function usually shown by the left side of the brain; in rare instances it is associated with the right side, when the individual exhibits pure left handedness, with often other reversed actions.

VARIATIONS OF DEXTRALITY

The evolution of this function of dextrality presents many functional variations. Where it attains high degree the left hand may be capable of almost as specialized refinements as the right. Famous masters of expression whether by hand or word, most great artists and many linguists, are on record who could use either hand for their work; the men who attain reputation in ophthalmic operations can generally make much greater use of the left hand than most individuals; these people are truly ambidextrous. On the other hand there are those in whom dextrality has not been fully developed, whose fingers are all thumbs, and who are often equally bad with either hand; they might by a figure be called ambisinistrals, and one does not think of them as usually fluent of speech.

From the developmental stand point there are then three classes of functional attainment in dextrality, namely:

I. The highest development of both hands in true ambidexterity.

II. The ordinary development, one hand well developed in function, the other mainly accessory.

III. Defective functioning of both hands, a poor dextrality which is more an ambisinistrality, and probably includes many of the so-called left handed.

With the small first class is associated high intellectual expressive attainments, with a low proportion showing any kind of defect.

In the enormous majority who make up the second class, right or left handedness is an accident not expected to affect mentality, and other defects will be present at the average normal rate.

Whilst in the last class are individuals whose dextrality has not properly developed and who in this sense are mentally defective, and on further examination may be expected to present not merely *gaucherie* but speech defects and the various degenerative stigmata in relatively large proportions. Dexterity and *gaucherie* thus represent extremes of a mental make up varying from the best of class I to the worst of class III. Training and practice and imitation of others will lead to further subdivisions in the observed capacity of the hands, poor dextrality may be improved and many left handed may be trained to do right handed work, and thus in a sense to appear only partially left handed. It is to be remembered that training a left handed child to write normal script is quite a different series of muscular actions, as will be seen later, from those done by the ordinary writer, so that education may have greater strain for some.

As a quality like dextrality is a function of development it is obvious that any inquiry would have to be based on individuals of like physiological development. The results for different sexes, for different age groups, or from a nursery school or an infant school would all comport to different norms.

PREVALENCE

The prevalence of left handedness of all types seems to run from two to five per cent according to methods of testing, probably four per cent is about the general average; this however may include merely awkward so-called left handed.

The most extensive and recent enquiries have been made by questionnaire in schools; this method however can never replace a careful detailed analysis of a comparatively few cases, which yet remains to be done.

In the Berlin elementary schools report for 1910-11 is a reference to the work of Dr. Schaefer who out of 17,074 children in his returns found 692 or 4.06 per cent left-handed (boys 5.15, girls 2.98 per cent) and 0.21 ambidextrous; of left-handers there were fewer in the upper than in the lower classes, and a family history of left-handedness was given in two-thirds, being 16 per cent in parents, 8.2 per cent in grand-parents, 2.5 in all three generations, and 33.5 per cent among near relatives. These findings are in agreement with Jordan's conclusions that left-handedness is of recessive char-

acter and descends from father to son. Among the 17,000 there were five cases of transposition of viscera (*situs inversus*) all right-handed.

In London elementary schools about the same time Ballard's questionnaire noted 13,189 children with 545 left-handers or just under three per cent. Among the 944 in special schools were 62 left-handed (6.5 per cent).

In St. Louis, Wallace-Wallin noted in 1915-16 of the 89,000 elementary scholars 2.8 per cent (3.6 boys, 2.1 girls) as left-handed, and a small number (128) partially left-handed.

On the other hand, a few years earlier Stier, writing on German soldiers, found 3.9 per cent out of a quarter of a million men, varying with districts and social rank from 2.3 to 6.5 per cent. The one year volunteers ("Einjährigen") of superior education and social rank showing least.

Jordan in his work on Heredity places left-handers as 2 per cent among normals, 5 to 8 per cent among lunatics, and 22 per cent in criminals.

TESTS OF DEXTRALITY

In distinguishing the dextrality of a person, attention is paid to the preferred use of the right or left hand in certain special acts, such as writing.

Prof. Max Meyer of the University of Missouri puts forward the statement that infants are at first left-handed and that dextrality develops towards the end of the first year of life. This, he states, should be expected as a consequence of the general right-handedness. His theory which seems more ingenious than probable, is that as the left side of the brain is the more specialized it is also slower in development, and meanwhile the right side is functionally simpler and earlier matured, and carries on with the result that the child is left-handed.

The infant, until the stage of evolution signified by the beginnings of speech development towards the end of its first year, grabs with both hands and shows little evidence of dextrality. During the latter part of the first year this only slowly develops, so that even the toddler has often to be corrected as to social conventions in shaking hands or using its porridge spoon, or knife and fork. Many children commence to play games left-handed, and it is getting quite fashionable

to adopt this pose. Spontaneous writing in its first beginnings will be referred to later, and the nursery school may be expected to throw a flood of light over the development of mental functions of this nature.

The general test is the use of the right hand as principal hand in special acts. Among soldiers, Stier thought the polishing of shoes or the cutting of bread the best tests and least interfered with by education. He states also that 95 per cent of the right-handed kick with the right foot, and 75 per cent left-handers with the left foot. Other smaller tricks of spinning coins, dealing cards and so on may show the tendency, not eliminated by special training.

Rosenbach's test of the eye used mainly in fixation and relative suppression of the image in the other eye is a rough experiment useful as a test of dextrality. Two objects, one near and the other distant are looked at with both eyes, say a finger held up at arm length, and adjusted so that the finger covers a chimney or spire twenty to a hundred yards away. Strictly speaking one of the objects should be seen doubled, but unless attention is specially directed to it, or the lighting very brilliant, this is not usually noticed, the second image being neglected and only the overlapping images attended to. On closing the left eye no apparent change occurs in right handed people. If now, however, the left eye is opened and the right closed, the finger appears to have jumped many degrees to the right of the chimney or spire as the case may be. The right eye having been used in fixation of both objects, the left only as accessory, causes this left to need readjustment for distant fixation and the image of the finger seems displaced relatively to the chimney. With the majority of left-handed persons the reverse is noticed, as the left eye is generally the fixing eye, and on closing the left eye the finger appears to have jumped to the left of the chimney. The test is very rough and Ballard found 43 per cent sinistrals and 45 dextrosinistrals left-eyed. Right-handers appear nearly always right-eyed, other ocular conditions being equal, and in purely amblyopic cases with squint the majority have the left as the squinting eye, fixing with the right. In connection with the Air Force, I believe, it was noticed that a quicker visual reaction time, either simple or dilemma, with the left eye generally meant a family history of some left-handedness even if the individual was not himself left-handed.

The rapidity of tapping and the strength of grip have also been relied on to show up what may be called latent dexterity in the left hand.

Wherever in absence of noticeable peripheral cause, there is found more efficient action on the left side as compared with the right, the individual may be taken as left-handed, but where there is no great difference and both sides are below the average it may be safely regarded as merely a case of poorly developed mental function of weak dextrality. The determination of dextrality may be worth enquiry as an early indication of retarded or defective mentality. The knowledge of right and left comes later. Binet and Simon use this last as a test. "Show me your left ear." At four none point to the left ear, at five half, and at six all normal children.

MIRRORED ACTIONS

In many people abnormal action in the psychical sphere results in some actions being mirrored, that is, lateral inversion of what is intended happens. Although this specular inversion is frequently associated with left-handedness quite an independent mechanism seems to cause the result.

A condition resembling this and known as *allochiria* has been seen in the sensory sphere where localized unilateral sensations, touching the skin for instance, are referred to the corresponding points on the other side of the body; these are almost always hysterical cases where there has at some time been *hemianaesthesia*.

In certain unilateral spinal lesions somewhat similar sensory signs have been seen, and *an\allokinaesia* is also described where a patient told to carry out a one-sided movement does it on the opposite side, and if the eyes are shut is not aware of his error. These spinal symptoms point to the existence of double-sided routes in the cord.

In certain war wounds of the brain the patient when recovered appears quite well in every respect except that he has lost visual orientation, he recognises but cannot point correctly to an object that he sees, and cannot tell by vision the distance or size of objects. Orientation in general is therefore evidently very complicated, but it is probable that specular inversion the most easily disturbed may be comparatively simple.

The commonest example of these inverted actions is mirror writing where what is done resembles the image of ordinary script as seen in a mirror, the individual peculiarities of the hand-writing being retained. It has long been known. There is a record written in 1688, of a girl of 21, who, after a hysterical attack, is described as writing "laeve manu, ordine inverso, a dextra versus sinistram, Judacorum more" and "quae scripsisset legi non posset nisi obversa speculo." Even earlier than this however Leonardo da Vinci had done in this way writing which still exists, having suffered in his later years from a paralysed right arm. These are cases where the writing was done with the left hand. Mirror writing also occurs pathologically with the right hand, being common among hemiplegics and others with brain disease, although even here unusual with better class or well educated individuals. It is to be observed frequently in the developing child. Children becoming deaf soon after birth are said to generally mirror with the left hand, but if deafness supervenes later the mirrored writing does not occur. These observations only indicate the value of early education as a normal corrective. Practically every child produces mirrored writing at some time, generally in writing or printing its own name. Village sign boards often show that older but comparatively unpractised hands have mirrored S or N and sometimes R.

Small children in learning their letters have many tricks which are common as partial but more rare as complete mirrored work. Reversals in this way point to a lateral orientation being developed *pari passu* with dextrality, and being of like nature.

Sir William Barrett, too, notes the frequent lateral inversion of drawings in experiments on thought transference.

A journal account "that he reads every letter of the alphabet upside down and can only read from right to left is the extraordinary perversity of a five years old school boy" was an extreme case of a bright and teachable little fellow, who no doubt in a short time became quite normal. These vertical inversions show occasionally among the youngest beginners in partial forms, but in this complete form are of the greatest rarity. The young child beginning its literary efforts may reverse the letter it copies and it may do this with the hand moving either adductor or abductorwise and sometimes reverses in the fashion of the "upside down boy."

Drawings are also likely to be reversed. It is quite a revelation to show a class an inclined crescent moon figure on the blackboard for a few seconds and then ask them to draw the figure they have seen; it may be reversed or inverted or both, but is seldom correct. These children soon modify their mistakes and then, in a few, another form of reversal may take place so that whilst the eye has to be used it checks the muscular movements, and the child now only mirrors signs which it already knows intellectually and holds in memory.

One small left-handed girl in a Montessori class wrote mirrorwise on the left hand page of her copy book, but normally on the right side; she was used to script and not to capital letters. Mirrored writing set as a copy she produced exactly as she saw it on either page. She could not tell the time and by eye reproduced a diagram of the clock face with hands at three o'clock correctly on either page, but anything graphic with which she had made previous acquaintance was correct on the right but mirrored on the left page of her book. Similarly infants tested with copying English and Russian words only made mistakes with letters common to both alphabets, but copied correctly the complicated letters peculiar to Russian, whose form they had never seen before. They were like the German peasant who not knowing the Roman alphabet when tested on PARIS wrote P, A and I correctly and reversed the R and S which he knew. Apparently where the optical image has to be carefully followed the motor impulse is adjusted, but where the image has already been stored in the mind as a memory or idea and is merely liberated, mirrored reproduction easily occurs. These mental reversals are easy as one learns on working with the ground glass screen in a camera. In copper plate etching designs have to be drawn reversed and this is done by the etcher, although Meryon, the etcher of the famous "Devil of Notre-Dame," and who himself died insane, is said to have turned his back always on the view and worked from a small mirror.

In writing, the movement of the right hand is abductor-wise, the little finger moving forward first. If similar abduction movements are done with the left hand, the little finger going first, then the direction from the middle line of the body is not from left to right but the opposite, right to left, and the ordinary movements are mirrored. Theories

have been based on abduction being the easier, but it is to be remembered that the oldest and oriental writings, including Jewish and Japanese, are right-hand adduction writings.

A purely left-handed child (right-brained) who started writing or lettering with the left hand, on attempting to use the right hand and using homologous muscles, doing corresponding movements adduction or abduction respectively, would do lettering mirrorwise with the right. For the same reason in an ordinary right-handed person the corresponding writing normal to the left hand will be the mirrored script of that done by the right; by experience the individual has generally learned to correct this and by a wholly different set of muscular actions produces a poor but correctly oriented imitation of the script done by the right hand. This generally, too, applies to children with the right hand crippled before school age. Where during ordinary school life this correction has not been attained, strong suspicion is raised of subnormal mentality, and in the case of children with speech defects the unusual persistence of mirrored script on attempting writing with the left hand justifies a very guarded prognosis as to speech improvement. On the other hand, after puberty, when the handwriting is formed, the more rapid and mechanical ordinary script has become, the more it is muscular and the less under ocular control; therefore, the easier and more likely is the expert young adult to write mirrorwise with the left than if writing slowly and watching carefully instead of working almost automatically. A reversed lateral orientation is not uncommon among the feeble-minded, and in many cases is accompanied by partial or developmental aphasia. In recent years examples of mirror writing have been published by more than one writer on the subject who had not examined the specimens with a mirror, or it would have been noted that the children were word-blind to the extent of gibberish aphasic writing. Specular inversion until the habit of dextrality is fully established seems comparatively easy. The failure to correct mirrored writing with the left hand after say the age of ten, has been referred to as a possible test of want of higher control; establishment of mirror writing as a habit has also been used as a psychological test for learning capacity.

SPEECH ASSOCIATIONS

The relation of speech to left-handedness is not clear. Stammering is said to be set up occasionally in left-handers by attempting to correct their left to right-handed work. One or two cases are quoted where stammering has been cured by training a child to left-hand work, although suggestion as a factor is never mentioned. The corresponding action of teaching ambidextral work has not been accused of having speech disturbance as a danger, nor has amputation or palsy of the right hand been associated with stammering as a sequel. Probably this claim of the disturbing effect on speech is due to misread statistics, or to the particular impression produced by one or two neurotic individuals.

In Ballard's observations, the questionnaire gave 1.2 per cent of right-handed with speech defects. He personally examined the 322 left-handers among 11,939 children; 51 of these were pure sinistrals with no stammerers, and 271 dextrosinistrals, who had 46 with speech defect at the time of observation, and 24 who had previously stammered. From these figures, assuming the dextrosinistrals to be left-handers who had been trained to use the right, he concluded that the training had caused such defect. Similarly in Berlin, speech defects were noticed as more prevalent among the left-handed.

Wallace Wallin who is an iconoclastic truth seeker, only "mildly corroborates Ballard's results," although he gives the proportion of speech defects in left-handers as 4.9 per cent, nearly double that of all children. It might be noted in passing that the age distribution in the two groups, the left-handed averaging much less than that of all the children, may account for most of the difference. Further, of Wallin's cases with speech defect, 81.4 per cent began before school age and "the vast majority of our left-handed pupils who had been taught to write with the right and had not developed any speech defect."

Mrs. Scripture classifies 25 per cent of 500 cases of speech defect as either left-handed themselves or in their families. She apparently thinks, although she does not state it, that right-brainedness plays a considerable part in the etiology of speech defects. She quotes a young man of 20 affected with word-blindness and stuttering who was cured by reversing the hand, an explanation of the case one is indisposed to ac-

cept. Claiborne from experience with his own boy advocates the treatment of all stammerers and word-blind by making them use their left hand. The general conclusion may be formed that in pure left-handedness there does not appear to be any special disposition to speech defect but that in the cases of poor dextrality associated speech defect is somewhat commoner than usual, whilst the evidence of any close connection between direct production of speech defect and stress from educational training of the hand is quite trivial.

Education is subject to violent crazes which rise, flourish and vanish. Such was the ambidextral craze of a generation ago. One of its chief exponents, Liberty Tadd, gave the schools, however, the idea and practice of free arm drawing, a permanent value not yet fully appreciated, whilst his bi-manual drawings have vanished. Here the child was encouraged to do symmetrical drawings, the left hand mirroring the right. The work was quite valuable in helping the youngest children to develop semi-automatic muscular actions in contra-distinction to the continuous eye control of writing and drawing movements previously insisted upon. There was also an Ambidextral Society where others, gifted mostly with a high degree of dextrality, assumed they could develop the right side of the brain by training the left hand, a physiological masapprehension on which they played much. They were indeed setting up a second method of obtaining similar results by teaching writing, for instance, to be done by an entirely new set of muscular actions to that already developed, as unnecessary as learning to get into a house by the attic window instead of through the door, and if the stammering theory just discussed had any reality it should have produced much speech disturbance.

As a school subject, left-handed training has had wide trial, but been everywhere given up, even as punishment at Eton. Berlin experiences showed that by transfer the writing of the right hand suffered. Ambidextral culture in this sense as an educational ideal is unscientific and may be left in its limbo.

Mlle. Kipiani of Brussels proposed with a view of saving fatigue to use the old boustrephedon method, going in alternate direction like the ploughing ox, as seen in some of the oldest Greek inscriptions and as done by many children still in their spontaneous early efforts at printing. The eye in reading print would run along the top line from left to

right, then on the second line printed in reverse would run back right to left, and so on alternately. Similarly in writing, alternate lines would be mirrored. It would mean spreading the work over a double set of muscles, but still the mental effort would not be diminished.

EDUCATIONAL TREATMENT

The ease with which children learn capital letters seems related to the greater proportion of simple up and down strokes. The so-called manuscript or print writing largely avoids complicated lateral movements, and is thus easily learnt by young children, excellent results being uniformly obtained as a result of the simplification.

For the educational treatment of an apparently left-handed child a sound diagnosis is of first importance. In a case of pure left-handedness giving any other indications, left-footedness, left-eyedness, parting the hair on the right, and so on, the child is probably right-brained and the best result would be got by allowing the left-sidedness to go on. Against this is the fact that with a good brain and well developed dextrality it will be a great advantage if early habits of right-handedness are formed for the most common and essential acts. The purely left-handed should have no confusion at any time in any acts to which they have been trained, but the defectively developed and partially left-handed are quite likely to be in danger under circumstances requiring rapid action and perhaps with right-handed tools or control. It is in the case of these so-called ambidextral children, the defective and partially left-handed, that dextrality is in need of education and development; let it remain ambidextral but train the right hand as much as possible. There will be very few cases where the teacher will not be wise to do the most to develop the right. Education should bring out the individuality as far as possible, but when this means making a person a nuisance or even possible danger to his neighbors, then it is better for correction. The development of right-handed function is therefore to be advocated as educationally harmless and desirable.

PUBLICATIONS RECEIVED

EVERYDAY MOUTH HYGIENE. By Joseph Head, M. D.
D. D. S., Dentist to the Jefferson Hospital, Philadelphia.
Philadelphia, W. B. Saunders Company, 1920. 67 pp.
Ill. Cloth, \$1.00, *net*.

The formation of pus pockets where the infection has found exceptional opportunity for growth is described fully and illustrated by drawings, diagrams and actual photographs of patients. The destructive enlargement of such a pocket is traced diagrammatically, indicating how the bone around the tip of the adjacent molar root may be completely diseased and replaced by a spongy mass of infection. Each time the tooth is used in chewing food, the infected root is jammed on the spongy infection beneath, so that the poison and germs are driven into the bone substance, whence the circulation carries them to all parts of the body to lodge and form new areas of infection. The point is made again and again that those portions of the body that have the least resistance receive the injected material, whether it be the joints, the heart, the stomach, the nerve centers, or the liver. The purpose of this attractive little volume is to inform its readers of proper and efficient methods of caring for the teeth in order that the complications which dental science today is laying at the door of the teeth may not be fostered.

FOOD FOR THE SICK AND THE WELL. By Margaret
J. Thompson, R. N. Yonkers, World Book Company, 1920.
82 pp. Cloth, \$1.00, *net*.

This is a little volume of receipts arranged to comprise a well regulated diet for the sick and for convalescents as well as for the well. Receipts include breakfast cereals, breads, eggs, soups, meats, fishes, cereals, vegetables, salads, desserts, cakes, albuminous drinks, jellies, canned fruits and cheese dishes. An additional section is devoted to special medical care of the sick and convalescent, such as baths, sponges, hot-packs, salt-rubs, poultices, plasters, enemas, douches, etc.

HEALTH WORK IN THE UNIVERSITY OF NEW
MEXICO. Issued by the Department of Hygiene of the
University. Albuquerque, N. M. December, 1919, No 3.
14 pp.

Being an exposition of the work undertaken in 1919 by the University as the institution in New Mexico designated by the Interdepartmental Social Hygiene Board for the study and prevention of disease, especially of the social diseases. The Bulletin contains also a statement of the work done by the joint laboratory of the State Department of Health and the University of New Mexico.

A STATE PROGRAM FOR THE CARE OF THE MENTALLY DEFECTIVE. By Dr. Walter E. Fernald, Superintendent of the Massachusetts School for the Feeble-minded at Waverley, Massachusetts. Reprinted from *Mental Hygiene*, for October, 1919.

While there is no panacea for feeble-mindedness, the duty of the state is to do whatever lies in its power to check its spread. Such a program should include the following lines of work: the mental examination of backward school children; the mental clinic; the traveling clinic; the special class; directed training of individual defectives in country schools; instruction of parents of defective children; after-care of special class pupils; special training of teachers in normal schools; census and registration of the feeble-minded; extra-institutional supervision of all uncared-for defectives in the community; selection of the defectives who most need segregation for institutional care; increased institutional facilities; parole for suitable institutionally-trained adult defectives; permanent segregation for those who need segregation; mental examinations of persons accused of crime and of all inmates of penal institutions; and long-continued segregation of defective delinquents in special institutions.

MANUAL FOR CONSERVATION OF VISION CLASSES.
By Winifred Hathaway, Secretary of the National Committee for the Prevention of Blindness. Publication No. 18, November, 1919. 108 pp. Ill. 50 cents.

This is by far the finest manual available on the subject of special classes for those children who are of defective vision. It includes a historical discussion of the beginnings of this sort of educational endeavor in Cleveland, Ohio, and its subsequent expansion in other cities of this country, a description of the equipment essential for such classes, the training and qualifications of the special teacher, the nature and content of the curriculum, vocational guidance of partially blind children, etc. An especially valuable feature of the manual is the inclusion within it of a complete list of large-print books and other materials needed by such children.

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CATS AND HUMAN DIPHTHERIA*

By WILLIAM G. SAVAGE, M. D., County Medical Officer of Health
Somerset, (England)

It is rather commonly believed that cats may suffer from diphtheria, and that they may convey it to humans. It is the purpose of Dr. Savage in his contribution to the subject to (1) present a digest of the available evidence as other investigators have amassed it, (2) to present his own evidence as gathered by a considerable number of experiments, and (3) to make a critical analysis of all data available.

Under the first caption, the previous experimental work, is cited especially the work of E. Klein (1888, 89 and 90). This investigator inoculated 8 cats subcutaneously and 2 intravenously, with pure cultures of diphtheria bacilli, and made careful note of the results. Of the 10 cats inoculated, 4 remained quite unaffected, while all the others developed swellings at the site of inoculation and died within five to eleven days. Post-mortem examinations showed hæmorrhagic œdema, enlargements and congestion and fatty degeneration of various sections of the kidneys, and other complications. This experiment by Klein is much the most important of any previously recorded, but it must remain inconclusive.

What epidemiological evidence is available is largely circumstantial. Some bacteriological examinations of diseased cats asso-

*From *The Journal of Hygiene* (British), February, 1920. Vol. 18, No. 4, pp. 448-462.

ciated with diphtheritic patients have been made, but have been too incomplete in most cases to warrant dependable conclusions. It is true that many bacterial organisms, thus examined, have presented almost identical similarity of appearance and characteristics with the Klebs-Löffler bacillus, but it has rarely if ever been possible to isolate them in pure culture.

Dr. Savage's own investigations followed three lines of inquiry, as follows: (1) the bacteriological examination of the throat and nose of healthy cats not associated with any cases of human diphtheria; (2) the bacteriological and pathological examinations of cats associated with human cases; and (3) experimental investigations with kittens. As for the first of these, examinations of the throat and nose of healthy cats:—

In this experiment, 8 cats and 12 kittens were thoroughly swabbed. None of the 12 kittens showed the presence of any bacilli resembling the Klebs-Löffler, but with the 8 cats the results were less immediately convincing. 3 of them manifested no bacilli similar to the diphtheritic. Cultures made from the remaining 5, however, showed the presence of bacilli very similar to the Klebs-Löffler. Morphologically neither Dr. Savage nor the county bacteriologist who was called into consultation could distinguish it from the true diphtheria bacillus. In pure culture, however, they were able to demonstrate with certainty that, with one possible exception, none of the cats examined harbored Klebs bacilli.

In Dr. Savage's second set of experiments, only cats closely associated with human cases of diphtheria were examined.

Case 1. Severe case of diphtheria in the house. The throat of the sick child's favorite cat was thoroughly swabbed and the swabs implanted on blood serum tubes in series. The films showed numerous bacilli which morphologically could not be distinguished from the Klebs bacilli, but when isolated in pure culture they proved not to be the same.

Case 2. A similar instance of close association between a diphtheria sufferer and a cat. The latter was said to be ailing some days previous to the illness of the patient. Bacteriological examination of the cat's throat failed to reveal any definite symptoms of human diphtheria, although some bacteria very like the Klebs were undoubtedly present.

Case 3. Cat and patient closely associated, but the most careful examination revealed no diphtheritic bacilli.

Case 4. The patient was an 8-year boy who clung closely to his cat during his illness. The cat was described as "off its food"

some days before the child came down ill. Swabbing failed to reveal cultures of bacilli resembling the true Klebs bacillus. The animal was killed, but careful examination revealed no pathological lesions. Kidneys and other organs were quite healthful.

Case 5. The case of a child five years of age in an isolation hospital. The house cat was ill 3 to 4 weeks previous to the child's coming down, refusing to eat, and had discharges from nose and mouth. Kittens were born and the cat appeared quite well when the child was removed. 6 days later the animal was killed, but the post-mortem showed no membrane in the cat's throat, and no lesions anywhere in its anatomy. Cultures from swabbing were made, and bacilli morphologically similar to the Klebs bacillus were found. When, however, a guinea-pig was inoculated there was no reaction.

The third line of Dr. Savage's investigation concerned itself with experiments upon kittens. If cats carry or suffer from diphtheria it should be possible to infect them with the disease artificially, and so set up either condition. Kittens, as being more susceptible, were used for the experiment. The kittens were all kept in separate cages. Altogether 19 separate experiments were conducted, both with swabbing the throat and injecting sub-cutaneously. In each of the 19 cases Dr. Savage found it absolutely impossible to infect by the most thorough throat-swabbing. Very acute human cases were used as sources of supply of the bacilli used. Two of the strains employed were so virile that, when subsequently injected sub-cutaneously, they caused the death of the cats. Not only did the swabbing of the cats' throats not infect, but the bacilli invariably *disappeared* within 24 hours from the throats of the cats. The same was true of the nasal cavities. In feeding the cats, vast numbers of Klebs-Löffler bacilli were consumed, but without discernible results, either immediate or as revealed in post-mortem examination.

"These experiments suggest that the secretions from mucus membranes of the cat are peculiarly unfavorable to the growth of diphtheritic bacilli, and will not even permit them to remain as saprophytes."

In analyzing the data derived from his own and other studies, Dr. Savage concludes that the evidence of the susceptibility of cats to diphtheria is extremely weak and unconvincing. It appears not unlikely that those investigators who have believed otherwise have been misled by the remarkable morphological resemblance between the pseudo-bacillus frequently present in the naso-pharynx of cats and the Klebs-Löffler bacillus. When,

however, the former is isolated in pure culture the difference is easily noted between it and the diphtheritic bacillus. Illness in cats, so frequently mentioned as a proof, is, no doubt, very often due to infectious disease from which felines are not immune, but there is no justification for dragging in the human factor to account for it. There is little if any evidence of a cause-effect relationship between human diphtheria and the feline type, or vice versa.



PROBLEMS OF PHYSICAL EDUCATION*

By DAVID SNEDDEN, Columbia University

There have been many times in world history when certain social classes and even whole nations have placed a premium on physical efficiency, but almost without exception those aspirations have sprung from the necessities of war or the chase. It has remained for our more democratic and humane age to conceive a higher interpretation of the essence of physical education. Many school systems are now promoting some form of physical education, while the states and the Federal government are beginning to manifest no little interest in the matter.

In general, the ideals of physical education as they are so frequently set forth are unassailable, but in specific aims and practices and principles those ideals are often woefully lacking. The time is now ripe for all interested persons to inquire more deeply than heretofore into a variety of questions of relative values in physical education, the climax of propaganda having now been reached. In the first place, the matter of terminology is very misleading and needs simplification. "Physical culture," while it is now dropping into disuse is almost to be preferred to the overworked "physical training." The author prefers to employ the term "physical education," which he defines as covering "all forms of assisted and controlled development, instruction, training and cure designed to conserve the physical health and growth of children towards a manhood and womanhood characterized by healthy, strong and enduring bodies, with whatever of ideals, knowledge and habits is vitally related thereto." Such broad interpretation would properly cause the following provisions for physical education to be instituted by society to the end that boys and girls may develop in accordance with the above mentioned aims: (a) safeguarding of the conditions of physical nurture, including food, rest, shelter and bodily protection; (b) opportunities for sports, athletics, swimming, scouting, and the like; (c) opportunities and incentives for simpler play; (d) for general calisthenics and gymnastics; (e) corrective gymnastics; (f) specific physical training; (g) military training; (h) instruction in hygiene; (i) hygienic and sanitary school environments; (j) medical inspection; (k) provisions for productive

*Abstracted from *School and Society*, May 8, 15 and 22, 1920.

physical work as a means to fundamental physical development.

In plant and animal life physical evolution takes place "automatically"; so we find the great number of young conscripts to have "jest growed," with little real "training." It is true, however, that the conditions of civilized human life are such as to render it increasingly difficult for the human body to reach optimum development. Mankind has created artificial conditions for himself, just as he has for highly bred cows and cabbages and apples, and it is just as essential to 'assist' nature in the former as in the latter process. Since artificial substitutes for 'natural development' are always undesirable, it follows that all physical training must be based on a clear conception of the respect in which the natural is to be aided. Any other test of a physical education precept is erroneous, and we must be warned against accepting many of the standards of physical development frequently exploited by the professional athlete and gymnast in their zeal to promote exaggerated symmetrical development.

On the corrective side, it is apparent to all of us that there is much of structural or functional irregularity to be found in children and adults. Many of these cannot be corrected. Others may be brought up to optimum standards according to their possibilities. It must not be lost sight of, however, that these standards cannot be army standards. The type of exercise recommended needs to be individual, inasmuch as few individuals in any moderate-sized group need just the sort of corrective treatment which an equal number in the same group might require. Whenever possible the type of physical training demanded of individuals should lay peculiarly serviceable foundations for the vocations which they have embraced or to which they naturally look forward. For example, "a young man from 18 to 22 remains undecided whether to become a dentist or a traveling salesman. Is it practicable during those years to give him specialized training against the strains of his vocation?" Or again, what should be the most desirable line of physical training for young girls who at from 17 and 19 years of age become in-door saleswomen?

One of the more urgent needs of a carefully thought-out program of physical education is to be met with in fostering the growth and development of girls during their pre-marriage years to the end that child-bearing may be made a less difficult and often dangerous function in the marriage years. Civilized society's addiction to sitting in chairs and riding in carriages, the reduction of manual work of the sort requiring frequent exertion

of the trunk and hips and other concomitants of civilization operate to make child-bearing often burdensome to those who are but poorly fitted by physical training to assume it. Besides, it is open to question whether programs of physical education provide for permanent recreational interests of adults. "Do educators expect women, after marriage, or on taking up salesmanship or stenography, to find tennis or basket-ball suitable forms of physical recreation? Why should not the school time of physical education be used in part to cultivate interests in walking, running, hiking, etc., with companions or without?"

The instinct of competition is one of nature's strongest whips, and it has been the experience of past decades of physical training that the success of the strong was accompanied "by the intoxicating pleasure of having beaten rivals, whilst the failures of the weak were embittered, so long as sensitiveness remained, by humiliations, often carefully staged in public view." This mistaken spirit has long since disappeared in large measure from the *mental* side of education, but it is still tolerated in *physical* education. Emulation leads to the forming of rival supporters, to search after star performers, to prolonged preliminary training, to the staging of exhibitions and to contests for prizes and public approval. Thus the true aims of physical education—to develop the individual, and *every* individual—have been pushed aside and nearly lost sight of. Covered gymnasiums, covered swimming pools, cinder tracks and the like have been another result on the equipment side which has helped to misplace the proper emphasis upon the *surroundings* and away from the *individuals* who are to be physically educated! "Surely the gymnasium is a nursery of mollicoddles! And what shall we say to the indoor swimming pool, that structure far surpassing the dreams of the luxurious Romans in its tile linings, its nickeled showers, its mechanisms for warming and pumping and purifying the water? Someone has suggested that the only next possible step would be the 'perfuming' of this dainty apparatus!"

THE RELATIONSHIP OF HEALTH TO EDUCATION*

By DR. H. G. BURNS, Supervisor of Hygiene, Pittsburgh

Of all the contributions made to the several sections of the recent Educational Congress of the Commonwealth of Pennsylvania, the paper presented by Dr. H. B. Burns of Pittsburgh to the section on health education was one of the most significant. The title of Dr. Burns' discourse appears in the *Proceedings* as *The Relationship of Health to Education*.

Children must be made to progress physically at least as uniformly as they do academically. Their increase in weight and height should be at least as constant and continuous as their progress in English and Arithmetic. Certificates of good health for the graduates of our public schools should be as much a matter of educational concern as are certificates of academic or industrial proficiency. The ten best years of child growth should never be permitted to become ten years of slow and insidious undermining of vitality. The recent experience of many countries demonstrates the fact that a soldier can be drilled, if necessity demands it, in three months, but that many times that amount of time may be required to repair the serious physical faults of the recruit.

Never before has so much of the world's future and its civilization depended upon the physical welfare of its children, and it is incumbent upon us to be just as solicitous for their bodily growth and requirements as we now are for their mental growth. It would be no less reasonable to expect minds to grow and develop to their fullest and ripest fruition without instruction and without discipline than to expect human bodies so to develop unaided, unadvised and unguarded, although in the past education has done little to foster the correct and normal evolution of the physical side of childhood. *Health*, in its broad aspect, is the possession and exercise of physical, mental and moral power. It is not merely freedom from disease any more than morality is

*From the *Proceedings* of the Educational Congress held by the Pennsylvania State Department of Public Instruction at Harrisburg last November "to consider existing fundamental American educational needs, etc." Harrisburg, J. L. Kuhn, Printer to the Commonwealth. 679 pp.

the mere absence of immoral act. Education at the cost of physical unfitness to serve and enjoy the results of service is an indictment no school system of the future can successfully defend. Education is incapable of much further advancement unless children are provided with better bodies upon which to build. A more equitable distribution of our efforts therefore between the body and the mind is the most urgent educational need of the hour. Humanity must build up its physical basis or else let up in its educational progress.

When the great war burst upon us we were a nation with a steadily shortening span of human life. That realization and the experiences of the war have demonstrated that the time has come wherein we must either be content to continue evolving a people physically less and less fit, or else we must stop and readjust the present relationship of health and education on a new basis. No man dare rest content with the first of these alternatives.

If we admit that the latter is the only rational course to pursue, we are driven incontrovertibly to the conclusion that a great deal more time must be devoted to health training of the school child than is at present given to that side of our educational system. A minimum of 25% of the total time which children pass in the schoolroom must be given over to training them in matters of sound health and sound body. The division of this time between the *theory* and *practice* of health will obviously vary somewhat with the age of the group and the material opportunities. Whether this new adjustment of the time relations can best be done by lengthening the school day or term, by reducing other subject materials or by a combination of both, is a matter yet to be determined.

Side by side with the increased amount of time made available for health training must go an increase in the item of cost. 25% of the total time in educational effort cannot be most effectively utilized with but 10% of the total appropriation. Money needs to be provided for plant, equipment, supplies, instruction, supervision and administration in health work with at least the same breadth of vision and foresight as in any other subdivision of the field.

A STUDY OF RURAL SCHOOL CONDITIONS IN OHIO*

By VERNON M. RIEGEL

Assistant Superintendent of Public Instruction for Ohio

Rural school progress has been very marked in Ohio during the past five years since the School Code of 1914 was enacted. This Code made adequate provision for the supervision and administration of rural schools by conferring upon county boards of education powers which they had not previously enjoyed.

Within the past five years much has been accomplished in the betterment of sanitary and hygienic conditions in the one-room schools.

As a result of the survey of 1913 it was found that many of these buildings were more than three-fourths of a century old and that some were of unknown age; that they lacked adequate cloak rooms and closets; that one-half were in need of repairs; that 99.6% of the toilets failed to meet the requirements of the state building code; that the janitor service was poor. Reports from forty-eight counties in 1919 show that only 143 new one-room school buildings have been erected within the past five years and that 260 have been remodeled and improved as to cloak rooms and closets. Twenty counties out of forty-eight reported that nothing had been done in the way of material repairs and 14 counties failed to report any improvement in toilets, although there are but few toilets connected with the one-room schools today that meet the requirements of the law and many do not meet the demands of society for moral cleanliness.

Observations show, furthermore, that special attention is being given to the care of the health of the children attending the one-room school in about fifty percent of the counties. In most of these, however, this has resulted through the efforts of the teachers to follow definite directions given by superintendents relative to the physical welfare of the children. An effort is being made to have the instruction in hygiene function in the daily life of the child thereby causing him to have an interest in his own

*Abstracted from a Study of Rural School Conditions in Ohio. Columbus, Ohio, Heer Printing Co., 1920. 175 pp.

physical well-being. Care of the eyes, teeth, the body in general, and the observation of correct rules governing ventilation, eating, bathing and posture, are not taught only as a means of information, but it is endeavored to secure such participation and practice as will result in habits conducive to the child's physical welfare and development. Weakness of vision, defective hearing, adenoids, enlarged tonsils, and kindred afflictions of children are reported to parents which has often resulted in the seeking of medical examination of such children, and advice as to their care and treatment.

Lighting, temperature, and ventilation are being emphasized and health and cleanliness in general are given a prominent place in the school program of many schools. Some counties are arranging for systematic health inspection and the recording of the physical condition of all the pupils, together with their mental rating and development. Eleven counties out of forty-five reporting have the services of a visiting nurse and eight reported medical inspection.



PUBLICATIONS RECEIVED

THE HEALTH OF THE TEACHER. By W. E. Chancellor, Chicago, Forbes and Company, 1919. 307 pp. \$1.25.

The purpose of this book is to guide teachers in the care of their own health while teaching, despite the necessity of accommodating themselves often to seriously unhealthy surroundings and regimen. The table of contents includes chapters on Spinal Curvature, Nervous Wreckage, Fatal Overwork, Errors of Parents in Childhood Care, Deficient Physique for Teaching, School Epidemics, Overeating, Clothing and Footwear, Relaxation and Amusement, What is Worry, Winning Old Age, etc., etc.

PHYSICAL EDUCATION, IN THE YOUNG MEN'S CHRISTIAN ASSOCIATIONS OF NORTH AMERICA. Revised edition. New York, The Association Press, 1920. 297 pp. \$1.50.

The present volume is a revision of the association textbook, "Physical Training", with corrections and additions. The chapters include the History of the Y. M. C. A., Its Field and Scope, Its Objects and Principles, General Organization of the Department, Department Program, The Physical Director, Amateur Athletics and their Administration, Training and Supervising Agencies, Physical Training in the Army and Navy, etc.

DANGER SIGNALS FOR TEACHERS. By A. E. Winship. Chicago, Forbes and Company, 1919. 204 pp. \$1.25.

A collection of 53 short chapters written in the author's well-known vein. It is intended to be rather inspirational than educational, but the epigrammatic style makes it well worth reading. The chapter headings include, among others, the following: Dig In; Don't Nag; Don't Putter; Tom, Dick and Harry; The Awkward Squad; More Boasting than Boosting; Triumphs of the Schools; The Politician in Education; Over the Top; The Foch Opportunity; Get Out of a Treadmill; Teachers Win the Battles; etc., etc.

ANALES DE INSTRUCCION PRIMARIA. Being Tomo 16, Nos. 4, 5 and 6 of the Elementary Education Department of Uruguay. Montevideo, G. V. Morino, 1919. 565 pp.

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HANDICAPPED CHILDREN

By J. E. WALLACE WALLIN,

Director Psycho-Educational Clinic and Special Schools,
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THE SITUATION.

Democracy cannot survive unless it is made just as thoroughly efficient, nay more efficient than autocracy! Is not this the lesson of the Great War to the democracies of the world?

Blessed with almost illimitable wealth the people of our American democracy have for many generations recklessly squandered their natural, economic and human resources.

We have wantonly denuded our forests, impoverished our soil, wasted our mineral and agricultural resources, and exploited masses of toilers while other masses of citizens, born in the lap of luxury and accorded special privileges, have been permitted to lead a parasitic existence without rendering any adequate return to society.

The folly of this waste has been demonstrated by the fact that from the dumps of "slag," "scraps" or "waste products" discarded by the industrial plants of a past generation the modern industrial conservationist, utilizing more efficient processes and using every possible by-product, has made greater fortunes than were made from the original processes. The modern efficiency engineer, armed with a chronometer and a knowledge of "time and motion studies," has proved that useless expenditure

of energy on the part of the toiler can be eliminated so that the working day can be shortened without any curtailment of output, and with positive reduction of the fatigue of the worker.

The Federal Commission on Industrial Relations estimated some time ago that we had an annual toll of 35,000 fatalities and 700,000 injuries involving disability of over four weeks, due to industrial hazards and occupational diseases, entailing an annual economic loss of nearly three-quarter billion dollars. The evidence is rapidly accumulating that a large part of this loss can be entirely prevented by the introduction of safety appliances, by the proper construction and sanitation of buildings and by the proper training of the employees, and the regulation of their working hours. The observance of "safety first" regulations in our every day modes of living has been attended by the same happy results.

During the past history of the republic workers who have been normal in body and mind have been engaged in lines of production which could have been just as efficiently carried on by persons who have been handicapped temporarily or permanently by physical or mental defects or disabilities. In consequence of this situation we have had an army of wage earners engaged in poorly paid occupations who were merely subsisting, while an army of defectives or persons with defects were living a parasitic existence in homes or institutions. Through mistaken sympathy and charity we have reduced these people to idleness and the ignominy of dependence upon others, while we should have trained them for trades which they could follow and have placed them in positions.

There are over 600,000 beds in institutions for the sick throughout the country. These institutions represent an investment of \$1,500,000,000, and the annual expenditure reaches \$250,000,000. The vast majority of these persons do not engage in any form of productive work during convalescence, although many forms of light occupation could be supplied which would be distinctly diversional and therapeutic in addition to being commercially remunerative.

On January 1, 1917, there were reported 225,824 mentally disordered persons in the public and private institutions throughout the country (Some of these were undoubtedly feeble-minded or epileptic patients without psychoses). The annual cost for the maintenance of these inmates probably amounts to \$40,000,000 under present economic conditions. It has been demonstrated again and again in the progressive insti-

tutions that a large number of these patients either already are capable or can be made capable by re-education of pursuing a variety of occupations with distinct profit to themselves from the standpoint of physical and mental hygiene, and with enormous economic advantage to the institutions and to society. And yet there are tens of thousands of potentially capable mentally disordered persons who are subsisting in a hospital ward or on a hospital lawn in complete idleness, and are actually deteriorating because of this enforced idleness.

CRIPPLED CHILDREN.

No governmental agency gathers any statistics of the cripples or of work attempted for their rehabilitation. The estimates of the number of crippled children in the United States vary from 50,000 to 250,000. On the basis of the ratio of crippled children under 15 found in Germany in 1910, we have 133,000 crippled children. The number, of course, would depend upon the definition.¹

According to the data published in 1914 by Edith Reeves, (*Care and Education of Crippled Children in the United States*), there were 37 institutions for the care of cripples in the country, 10 being hospitals, 14 convalescent hospitals or homes and 13 asylum homes. Five of the 37 were state institutions, two being in Minnesota and one each in Massachusetts, Nebraska and New York. These institutions contained 2,474 beds and during the year cared for a total of 4,901 children.² Seventeen institutions received appropriations from the state treasury, one-third of the income of the convalescent homes and one-seventh of the income of the asylum homes being derived from public funds. The average annual cost per child in 34 institutions was \$406. Schools were maintained in seven of the hospitals, all of the convalescent homes and eight of the asylum homes, the public schools supplying the teachers in 7 of these 29 institutions. There was no institution south of Baltimore or west of Lincoln, Nebraska, except one in Seattle, Washington. Public school classes were supported in New York, Chicago, Cleveland, Detroit, Philadelphia and Baltimore,³ while there were four pri-

1. The Education Committee of Birmingham has defined a cripple as a "person whose (muscular) movements are so far restricted by accident or disease as to affect his capacity for self-support."

2. To this should be added the hospital for crippled children recently established at the University of Iowa.

3. In our 1913 investigation Newark also reported an orthopedic class. A class was opened in the Minneapolis schools in 1920.

vate day classes in New York and one in Boston. Although definite statistics are not available, we have no hesitancy in saying that the majority of crippled children throughout the country are not receiving the school training which is suited to their needs and many do not receive the medical and surgical treatment which they require. With proper orthopedic and educational treatment the vast majority of these disabled children could be made positive social and economic assets, instead of being reduced to dependency or semi-dependency through neglect, as is now the case. The possibilities of the appropriate training of crippled children are indicated by the marvelous results already obtained in the rehabilitation and re-education of soldiers who have been maimed in the present war. The obligation which the state owes to restore injured soldiers to maximal efficiency, and which the state is now generously assuming as an urgent post war measure, nay as a sacred obligation, is not different from the duty which society has always owed to the child cripple, but which it has very imperfectly assumed.

BLIND CHILDREN.

There were 51,272 persons reported in the census of 1910 as "either totally or partially blind, in both eyes, so as not to be able to read even with the help of glasses," and it is estimated that this is 13,000 or 14,000 short of the true figure. 5,996 or 10.5% were under 20 years of age, but only 2,593 children were in institutions for the care of the blind. A certain number who were not in institutions were probably in public school classes. The Massachusetts Commission for the Blind recently found 3,698 blind in the state or a ratio of one blind person per thousand.

In 1915-1916 all the states in the union supported residential schools for the blind except New Hampshire, Rhode Island, Delaware, Arizona, Nevada and Wyoming. Public school classes were supported by Chicago, Detroit, Newark, New York, Cleveland, Cincinnati, Milwaukee and Racine. Of 71 schools for the blind reporting to the Bureau of Education, 58 were under the control of the state or receiving pay for state pupils, 10 were controlled by city boards of education and 3 were privately controlled. The value of the property and endowment of 48 schools reporting was \$14,659,506, the annual expenditures for 61 schools reporting was \$12,009,693, while the number of pupils enrolled in 61 schools was 5,155. It is not possible to

determine from the data at hand the proportion of the children in these schools who are totally blind and the number who are semi-blind or very-hard of seeing, nor the number of blind pupils retained in the regular schools. Nor are any statistics available on the number of blind persons at large in the community who have never attended school. In some sections of the country there are doubtless many such persons. We have heard of blind children who have been sent to county infirmaries where they have been retained for years or permanently without receiving any schooling. The fact that blind persons of suitable mental capacity who have been properly trained have become economically independent is sufficient argument for the extension of the training to all the blind who can profit from it.

HARD-OF-SEEING CHILDREN.

No extensive statistics are available of the number of children who are semi-blind, or whose vision is seriously and permanently impaired to a degree requiring instruction in a special class. Judging by the available data the number is probably larger than the number of totally blind. In recent surveys 200 such children were reported in Buffalo and 412 in Toronto, Canada. The semi-sighted at present are almost always assigned to the classes for the blind, or the classes for the mentally deficient,⁴ or backward, or (and this is more frequently the case) are left in the regular grades. Only a few cities have thus far established "hard-of-seeing" classes, or "conservation of vision" classes, viz: Boston (five classes), Charlestown, New Bedford, Springfield and Worcester, Massachusetts; New York City, Buffalo, and Rochester, New York; Ashtabula, Cincinnati, Cleveland, Lorain, Mansfield and Toledo, Ohio; Chicago, Illinois; Detroit, and Grand Rapids, Michigan; and Minneapolis and St. Paul, Minnesota. Ohio has 17 of these classes and Massachusetts 10. Complete justice can be done these children only in classes in which the methods and appliances are adapted to the incurably visually handicapped who are not blind.⁵ The results in Ohio indicate that where school inspection includes the examination of the eyes by a skilled ophthalmologist there is one sight-saving pupil to every 1600 of the school population, that many of the children entering the conservation-of-vision classes have been excluded from all educational advantages be-

4. We have taken occasion to refer to this fact in "Problems of Subnormality," 1917, pp. 51-55.

5. Winifred Hathaway, see Manual for Conservation of Vision Classes, 1919.

cause of their inability to use the ordinary equipment, and that about 33% have been returned to the regular grades when appropriate instruction has been provided in "hard-of-seeing" classes.

DEAF CHILDREN.

In 1910 the Federal Census reported 44,708 persons who were "*both deaf and dumb.*" "*Persons who are deaf but not dumb, or persons who are dumb but not deaf, are not to be reported.*" It is admitted that the returns were not very accurately made. A special investigation of 19,154 "*deaf and dumb,*" of those totally deaf who lost their hearing before the eighth year of life and of the "*partially deaf*" whose hearing became affected before the eighth year, indicated that 7,125 were less than twenty years of age, that 7,541 were reported as congenital cases, while 9,253 became affected during the first four years of life.

In 1915-1916, all the states in the union supported residential schools for the deaf except Delaware, Nevada, New Hampshire and Wyoming. Public day classes were maintained in fifteen states. Of 159 schools reporting to the Bureau of Education, 69 were state-controlled or received pupils at public expense, 71 were public day schools supported by city boards, while 19 were private. The value of the property and endowment of 66 state schools amounted to \$21,041,425, and the annual expenditures in 65 state schools \$3,850,476. There were 11,784 pupils in the 69 state schools; 2,362 in public day schools, and 587 in private schools, or a total of 14,733. From the available data it is, again, impossible to determine what percentage of the pupils in these schools and classes were totally deaf, what percentage hard-of-hearing and what percentage speech defectives with unimpaired hearing, nor can we determine the number of deaf pupils who have been retained in the regular classes or assigned to special classes for speech defectives, for mental defectives or for the backward, or the number of deaf persons who have never received any schooling. But it is probable that the number of deaf children who are not now given appropriate training reaches into the thousands and that because of this neglect, they will become dependents. Thousands of deaf children of suitable mentality have been made economically independent by proper instruction. The enormous amount of public money expended for their education has proved ultimately to be an economic gain to the state.

HARD-OF-HEARING CHILDREN.

There are no statistics available on the number of children whose hearing is so impaired (but who are not deaf) that they should be given the advantages of special methods in hard-of-hearing classes,⁶ nor have we any data on such classes apart from classes for the deaf, for oral instruction or for speech correction. It is, again, probable that there are decidedly more children of this type—possibly from 5 to 10 times more—than deaf children. They can be best trained in special classes, but these classes should be distinct from the classes for the deaf.

SPEECH DEFECTIVES.

If the ratio of speech defectives found in our survey in the St. Louis schools (Report of the Board of Education for 1915-1916, pp. 174-211) holds throughout the country, we have over 352,000 lispers and over 157,000 stutterers (including the so-called stammerers) in our public and private schools of elementary and secondary grade. There are no statistics available from which even an approximate estimate can be made of the number of speech defectives who are receiving the educational and medical treatment which their conditions require. But it is safe to say that the vast majority are left to "outgrow their handicaps," or at best they receive only the speech training which the regular teacher can give. The efficiency of many of these children will be permanently marred because of our neglect. There are many positions which are not open to persons who stutter or articulate very indistinctly no matter how capable they may be otherwise. Stuttering is a cause of rejection for service in the army. The large majority of public school systems have not thus far established departments of speech correction,⁷ although

6. The enormous variations in the public school statistics of children with defective hearing are largely due to differences in the standards. We are here referring only to children whose hearing is so defective that they should be in a special class. The degree of defect needed to make the child eligible for admission remains to be formulated.

7. No agency, not even the Bureau of Education, gathers annual statistics of the work done in the interest of speech defectives throughout the country. The writer included speech correction work in a questionnaire addressed in 1913 to public schools in all cities with a population of 4,000 or over. Only 302 schools of 1,350 addressed replied, and of these only 18 reported classes for speech defects: "The Mental Health of the School Child," 1917 (reprint), 383-429. The number has probably been increased three or four-fold since this investigation was made. The increase has been particularly marked during the last few years. For an earlier investigation see Van Sickle, Witmer and Ayres, Provisions for Exceptional Children in Public Schools, 1911, p. 69 f. (Government Printing Office).

the proper training of speech defectives is just as much a public function as the proper training of the mentally defective or the blind or the deaf.

SUBNORMAL CHILDREN.

1. FEEBLE-MINDED CHILDREN.

In spite of the numerous surveys made during the last decade, no statistics are available of even approximate accuracy as to the number of feeble-minded children and adults throughout the country. Moreover, were it possible to gather complete statistics, it is perfectly evident that the number returned would depend entirely upon one's concept of feeble-mindedness. If we included all those backward three or four years, and all those with an intelligence quotient less than .75 or .70 by the Binet-Simon scale, (particularly the Stanford version), using age 16 as the limen of mental maturity, the number would probably reach the absurd figure of 40 or 50 millions. We have for years repeatedly opposed the employment of arbitrary, artificial and extreme intellectual standards of feeble-mindedness. If we adopt the more reasonable socio-legal standard of Great Britain, according to which (1913 law), the highest grade of the feeble-minded are "persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision, and control for their own protection or for the protection of others,"⁸ the ratio of feeble-minded in the general population would probably be about 1 in 500. Assuming a population of 100,000,000, this would yield 200,000 feeble-minded in the

8. Tredgold's formula will be preferred by some. He limits the highest grade of the feeble-minded to "those persons who are so lacking in general mental capacity, in common sense, that they are incapable of subsisting by their own unaided efforts." The mental defective is "incapable at maturity of so adapting himself to his environment or to the requirements of the community as to maintain existence independent of external support." The legal definition in the Illinois Act of July 1, 1915, is as follows: "The words 'feeble-minded' in this Act shall be construed to mean any person afflicted with mental defectiveness from birth or from an early age, so pronounced that he is incapable of managing himself and his affairs, or of being taught to do so, and requires supervision, control, and care for his own welfare, or for the welfare of others, or for the welfare of the community, who is not classifiable as an 'insane person'." It is evident that we can define feeble-mindedness psychologically according to any self-determined, arbitrary standard. But the value of such a conception is largely academic. We must never lose sight of the fact that the fundamental criterion of "feeble-mindedness" is social: it represents a condition of social (socio-industrial) inefficiency which is due to deficiency of intelligence dating from birth or from early life, and which is so profound as to render the individual "incapable at maturity to maintain existence independent of external support." When the social inefficiency is not due to this cause it is advisable to classify the case otherwise—psychopathic, sociopathic, constitutionally inferior, constitutionally immoral, borderline with emotional and volitional defects, etc.

United States. Many years of experience in examining children in the St. Louis Public Schools leads us to believe that the percentage of feeble-minded children (using the term as above defined) in the elementary schools of this system is about one-half of one per cent, and this estimate agrees with Dr. Walter Cornell's estimate for the Philadelphia Schools and Dr. Clara Schmitt's estimate for the Chicago schools. If this ratio held throughout the country there would be over 102,000 feeble-minded children in the public and private elementary schools of the country—certainly a number so vast, in view of what is now being accomplished in the appropriate training of the feeble-minded, that nothing will be gained by the insistence, in spite of the lack of satisfactory proof, that 400,000 represents a "very conservative" estimate of the number of feeble-minded in our elementary schools.

In 1916, 38 state schools and 28 private schools for the feeble-minded reported to the Bureau of Education, while 118 cities reported "public day schools and classes for backward and subnormal children." The annual expenditures for 35 state schools reporting was \$6,702,147 and for 13 private schools \$252,462.

The number of inmates in public and private residential schools for the feeble-minded was reported to the Bureau of Education in 1915-1916 as 32,882, of whom 21,106 were in school. In the public day classes 16,524 pupils were reported, making a total of 37,630. The inference, from these figures indicate that over 62,000 feeble-minded pupils were not receiving proper instruction in special classes does not necessarily follow, for, on the one hand, some of the children in the residential schools and special classes were not feeble-minded—a large percentage of the pupils in some special classes we have inspected have been backward, borderline, speech defective, word-blind (most cases of dyslexia), hard-of-hearing and hard-of-seeing rather than feeble-minded—while, on the other hand, feeble-minded children hard to recognize may have been receiving individual instruction in ungraded classes which were not included in the reports.⁹ To illustrate, in the last available Report of the Commissioner of Education, the number of pupils in the St. Louis 'Schools for Individual Instruction' is given

9. The Bureau of Education has not sharply discriminated between special classes for mental defectives and ungraded classes for borderline, backward, and restoration cases. In attempting to gather statistics, on special and ungraded classes, as used above, we have previously pointed out the equivocal character of the reports: *The Mental Health of the School Child*, 383f.

as 383, but no mention is made of the pupils in the ungraded classes for the borderline, backward and restoration cases. The number of pupils in these classes in 1918-1919 was very much larger, namely 3265, as compared with 455 in the special schools for mental defectives. Some of those on the borderline in these classes will eventually prove to be feeble-minded, and will then be transferred to the special schools. But there is little doubt that the majority of the feeble-minded school children throughout the country are in the regular grades, receiving insufficient attention or instruction poorly adapted to their needs, at great eventual economic loss to the state. Fifteen states and the District of Columbia have not yet established residential institutions for the training or custody of the feeble-minded (A list of these states is given in *Problems of Subnormality*, 1917, p. 31. However, some of these negligent states are now building institutions). Illinois has enacted a clear-cut mandatory commitment law applicable to a feeble-minded person (as defined on p. 9 of ns.) when through "want of proper supervision, control, care and support, it is unsafe and dangerous to the welfare of the community for him to be at large without supervision, control, and care" (A somewhat similar law which we proposed through the Children's Code Commission for Missouri in 1915 failed of enactment. Minnesota has since enacted a mandatory commitment law, and possibly other states.)

2. BORDERLINE AND BACKWARD CHILDREN.

Our experience in the St. Louis public schools indicates that for every feeble-minded child there are from five to ten children on the borderline of mental deficiency and distinctly dull and backward who require individual and differentiated instruction in ungraded classes and elementary industrial schools. The assumption is probably conservative that at least 3% of elementary pupils throughout the country classify in this group, giving an estimate of over 615,000 pupils (aside from the feeble-minded mentioned above) who are too backward to do successful work in the regular grades.¹⁰ There is a larger group of children, probably from 10% to 20% of the elementary school enrollment, who are more or less pedagogically retarded in one

10. In this group we have found children with specific defects, such as visual aphasia, dyslexia, auditory aphasia, poor vision, poor hearing, speech defects, etc. Most of the children with specific defects whom we have examined have also been more or less backward intellectually. Many of the children in this group cannot be restored to grade or brought to full normality.

or more branches for one reason or another. These pupils are not in urgent need of special attention in ungraded classes, although they would greatly profit from such help.

UNRULY AND DELINQUENT CHILDREN.

It would, of course, be impossible to estimate how many "unruly," "ungovernable," "disciplinary," "incorrigible," "refractory," "morally unstable," "morally defective," or "delinquent" children there are, because the statistics, even if collected, would depend upon the definition, and no sufficiently precise definition can be formulated to secure uniform or accurate returns. Many children are "troublesome" or "disciplinary" intermittently, temporarily, or merely when confronted by certain conditions. However, the number of children in state reformatories or "state industrial schools" is annually reported to the Bureau of Education. In 1916, 121 state, city, county, and private schools receiving public appropriations, reported an enrollment of 61,828: 49,009 boys, and 12,819 girls. The average enrollment for the year in 114 schools was 35,603. 24,617 were committed during the year, of whom 2,856 were reported from 79 schools as unable to read and write. The value of the property of 114 schools reporting was \$46,226,458, and the expenditure for 1916 for 109 schools reporting was \$9,585,047. No annual register is kept by any governmental bureau of the number of ungovernable or truant children in disciplinary classes or parental or home schools connected with public school systems.¹¹ But in the aggregate, only a small percentage of troublesome children found in the schools throughout the country have been assigned to such schools or classes or have been given the special consideration which their condition requires. In some school systems children who are hard to manage are assigned to the classes for mental defectives, on the supposition that they are mentally defective or on the supposition that the training given mental defectives is the best training for "delinquents." Where careful physical and mental examinations have been made, it has been found that a considerable percentage of delinquent children are mentally and physically normal, a large percentage suffer from various phys-

11. Information concerning such classes has, however, been gathered: "Provision for Exceptional Children in Public Schools," Bulletin No. 461, Bureau of Education, 1911, p. 32. "The Mental Health of the School Child," Yale University Press, 1914, 383f. The most exhaustive and discriminating study of delinquent children is William Healy's "The Individual Delinquent," 1915.

ical defects (and some from patent nervous or psychopathic disorders), a large percentage are backward, and a certain proportion are feeble-minded. The majority of disciplinary children whom we have examined during the last decade have been subnormal, most of these, however, being backward rather than feeble-minded, while a certain proportion of them have been psychoneurotic, psychopathic or constitutionally inferior, or epileptic (reference is made to these types in the following section). A large number of the backward children whom we have examined have been more or less morally obtuse. At the same time, a large number of our delinquent children, defectives no less than normals, would not have become delinquent had they had better home care and had they grown up in more favorable environments. The necessity for making a mental and physical examination of delinquent or morally unstable children, and an investigation of environmental influences, as the first step in the program of care and treatment, has received wide recognition during the last decade, and yet it is probably true that adequate examinations are not made in the case of the large majority of the children before action is taken with respect to their disposition.

If it is true, as alleged, that most adult offenders can be recognized during childhood and youth—they are recruited from the unstable, defective, unruly, or truant pupils—we cannot spend too much effort and expense in the careful investigation of the internal and external factors which contribute toward the development of juvenile delinquency and crime, and of the measures which are effective in combating criminal tendencies, for the problem of crime must be attacked more and more from the point of view of prevention rather than from the point of view of retribution, reformation, or rehabilitation. The fact that the cost of the police department in most large cities, exclusive of the cost of courts, the loss or diminution of productive wages of the imprisoned, etc., is only exceeded by the cost of the educational department, indicates the concern, even from the economic point of view, with which the problem of crime must be viewed.

EPILEPTIC, PSYCHONEUROTIC, AND PSYCHOPATHIC CHILDREN.

No data are available on the prevalence of these types. The concepts of 'psychoneurotic' and 'psychopathic' children still

vary among different authorities. Epileptics are usually sent to institutions for the feeble-minded or insane—only nine states maintain separate institutions for their care and training—while psychopathic children in some states are sometimes admitted into observation wards connected with hospitals for the alienated. A large number of the epileptic and the vast majority of the psychopathic are at large in society and receive no special study or care. New York City has made an initial attempt to establish public day classes for psychopathic children, while two or three city schools have had classes for epileptics, but these classes have been difficult to maintain because of the precarious attendance. In some cities the epileptics are admitted to the classes for the mentally deficient. But children who are subject to seizures cannot avail themselves regularly of the advantages of instruction in public day classes. When they cannot be trusted upon the streets they must be kept at home, unless omnibuses are provided. Such children require the advantages of a residential school. Although the prognosis as to cure is not favorable, in the light of present medical knowledge, epileptics of fair mentality can, under proper care and treatment, be made partially or wholly self-supporting, particularly in supervised industrial and agricultural pursuits. Many epileptics are psychotic or are so unreliable morally that they require constant supervision and restraint.

We know too little as yet about the psychopathic child, but we nourish the hope that through prolonged scientific investigation we shall eventually be able to prevent or minimize the development of psychopathic, aberrant tendencies and abnormal behavior in children, and the frequent sequelæ of instabilities, crimes and psychoses in adults. In this field of human wastage and tragedy, more can be said concerning what we have left undone and what we do not know than concerning what we can now scientifically define and what we have so far accomplished.¹² The recent interest in "mental hygiene" augurs well for the future, and certainly the enormous amount of nervous and mental wreckage and disorder produced by the shell shocks and horrors of the war will arouse the nation to the necessity of continuously safeguarding and conserving the mental and moral health of the nation. This work must be begun with the children in the schools.

12. For a single text, treating briefly and discriminatingly of epilepsy, psychopathic disorders and moral delinquencies, we would refer to E. Tanzi's "A Text Book of Mental Diseases," 1911.

THE REMEDY.

Enough has been said to indicate the extent of our National leakage through inadequate care and education of handicapped children, and the need of developing a consistent and efficient nation-wide policy of "conservation" and "thrift" in this particular domain of social endeavor. The economic and social burden entailed by our neglect has cost the nation far more monetary loss than the support of adequate systems of examination and corrective training would have cost. Within the last two decades the demand for the conservation of our natural resources and for the organization of our economic, industrial, educational and civic activities more fully in accord with principles of scientific efficiency, has indeed directed attention to the necessity for the elimination, diminution or proper utilization of our human waste products. But the World War, with its stupendous sacrifice of human and material wealth—humanity's best blood—with its staggering cost which must be liquidated during the century upon which we have entered, and with the new ideals of Democracy born in its throes, will emphasize as nothing else could the necessity for the scientific husbanding of our material resources and the conservation and utilization of all our man power. In no field will the demands of the new Democracy be more keenly felt than in the field of education, for the very perpetuity of Democracy depends upon a responsive, educated, efficient citizenry.

In order to efficiently train the future citizens of the republic we must recognize two principles as fundamental: first, that every child who is capable of being trained, whether defective or normal, must be required to attend school during a given period of time; and, second, that we must provide the types of instruction and training which will maximally meet the peculiar conditions presented by each child.

COMPULSORY SCHOOL ATTENDANCE LAWS.

In 1916 all the states of the union had enacted compulsory school attendance laws, except Mississippi, but the laws are far from satisfactory, as evidenced by the following facts. While the average number of days in the school term was only 160.3, the average time attended by each child from age 5 to 18 was only 91.7 days. The percentage of attendance was thus only 57.2. Thirty states required attendance during the whole school

year (Louisiana, however, only when the school year amounted to 140 days or less); one state during 150 days; 6 states only from 100 to 120 days and 11 states only 80 days or less (3 of these only 60 days). The limiting age for the application of the law is 12 in three states (the limit may be raised in the cities in these states), 13 in one, 14 in eighteen, 15 in ten, 16 in fifteen and 18 in one. In Arkansas the law does not apply to eighteen counties.

In many states liberal exemptions are permitted. The attendance cannot be enforced when the children are "physically and mentally incapacitated," when there is "no school within a reasonable distance," when their "labor is needed for the support of the family," when the parents are "unable to provide clothing," etc. Frequently the law is nullified through non-enforcement, owing to the indifference of the local communities.

Adequately to meet the school attendance situation in the light of the needs of a socially efficient citizenship, the minimum length of the school year in every state in the union should be increased to nine months, the minimum time that the child must attend school should be eight years, compulsory attendance should be enforced universally for the whole school year, and the law should be applied to all educable types of children including the blind, deaf (eighteen states now apply the law to the blind and the deaf), crippled, feeble-minded and destitute. Exemption should apply only during periods of illness when attendance would be impossible or inimical to the child's health. Parents must be required by law to provide schooling either in a public or private school or institution, or in the home. The state should provide the necessities in the case of the indigent. Eight states do this now. The more handicapped a child is, the more essential it is that his efficiency be increased to the highest point possible, not only so that he shall be able to support himself, to the extent that this can be made possible, but so that he shall be made contented and happy through the ministration of profitable and wholesome employment.

DIFFERENTIATED TRAINING.

1. THE MENTAL AND PHYSICAL EXAMINATION OF SCHOOL CHILDREN.

A democracy should demand and vouchsafe equality of educational opportunity for "all the children of all the people." But this does not imply that all children must be subjected to a

uniform course of instruction. On the contrary, it means that we must supply differentiated instruction to meet the needs of the different levels of physical and mental capacity and the different specialized mental and physical abilities and disabilities which we find among the millions of differing children in the schools. In order that this work may be efficiently done—that is, in order to avoid over-differentiation, under-differentiation and wrong-differentiation—the schools must be organized more or less on the plan of the modern hospital. That is, the pupils should first be carefully examined and diagnosed before any attempt is made to differentiate the instruction. Doubtless the skilled teacher and school administrator can sometimes arrange special courses for the differing pupils with a fair measure of success after they have had ample opportunity to observe the children and test their learning ability. But the work will be more efficiently done if the child is first given a careful physical and mental examination, in order that his physical and mental condition may be better known, and in order that remediable defects may be discovered and corrected when possible.

Every new school entrant should be given a thorough physical examination. The examination should be repeated, if possible, annually. If this is impracticable, the child should be examined as and when symptoms indicate the need. It would also be well if every new entrant could be psychologically examined. But if this were impracticable, we should at least strive to psychologically examine all the children who present special educational problems before we attempt to differentiate their school work.

In order to carry out this program of work the schools must have available a co-operating staff of physicians, dentists and clinical psychologists. It would be well for the school system itself to maintain clinics for the eyes, ears, nose, throat, lungs, teeth, and nervous system, and a psycho-educational clinic, all manned by specialists. At the present time, the majority of school systems throughout the country, however, are without departments of medical, dental, and psychological inspection.¹³

13. For data on school medical and dental inspection, see Luther Halsey Gulick and Leonard P. Ayres' "Medical Inspection of Schools," 1908. For data on school psychological inspection, see J. E. Wallace Wallin's "The Mental Health of the School Child," Chapters II and XVIII. Medical and psychological inspection have spread considerably since the above books were written. For the latest measuring scales of Intelligence, see Lewis M. Terman's "The Measurement of Intelligence," 1916, and Yerkes, Bridges and Hardwick's "A Point Scale for Measuring Mental Ability," 1915; and for scales of psycho-motor development, see Pintner and Patterson's "A Scale of Performance Tests," 1917, and Wallin, Psychomotor norms for Practical Diagnosis, 1916.

One of the immediate after-the-war aims should be the extension of the systems of physical and psychological examinations to all school systems. This may necessitate the employment of county and state examiners, to serve rural schools and schools in villages and towns, which cannot supply their own examiners. There should be in every state a Bureau of Child Hygiene, in charge of a physician who is an expert on matters relating to individual and community hygiene and sanitation so far as they relate to the growth and health of children, and a Bureau for Mental Defectives in charge of an educationalist who is a specialist on mentally defective and retarded children, on psychological and educational tests and in clinical psychology.

Where the above suggestions cannot be carried out, the schools should employ a physician on part-time. Where hospitals and medical school dispensaries are available medical specialists generously offer their services to school children. Such service should be sought more frequently than is now the case by the schools, even when they maintain departments of hygiene, provided the latter do not have specialists on their staffs. In localities where the services of physicians or clinics cannot be secured, the teachers should be trained to make certain preliminary inspections for physical defects, and should be required by law so to do. This would include the rough tests of visual and auditory acuity, and the examination of the teeth and the spine for obvious defects.

Physical and psychological examinations without proper physical and educational treatment are of no particular service to the child concerned. The physical defects of many children fail to be corrected because of the indifference, neglect, poverty or hostility of the parents. Moreover, some children are not transferred to the special classes in which they can be given the advantages which their condition requires, for the reason that the parents object to their removal from the normal children, frequently on very trivial grounds. This situation should be met by the enactment of legislation which will enforce treatment, if necessary at the expense of the community, when treatment is clearly indicated and the parents refuse to heed the recommendations—the law should be invoked only as a measure of last resort—and by the adoption of a firmer policy on the part of school executives with reference to the transfer of pupils recommended for different kinds of special classes. Such transfers should be uniformly enforced unless there are very good

reasons to the contrary. The mere sentimental objections of parents should not be permitted to stand in the way of the child's best educational interests.

The view is gradually gaining acceptance that it is preferable to educate defective children in day classes rather than in residential institutions. The chief argument is that institutional life tends to "institutionalize" the children instead of preparing them for efficient participation in the activities of society outside of the institutions. Children are best prepared *for* society by being trained *in* society. Economically it seems advantageous to train in the public schools even those educable feeble-minded children who should later be placed under permanent custody in state colonies because of lack of proper home supervision and control. Nevertheless there will always be need for residential institutions, because there are not enough defective types in many communities to make it possible to establish special classes.

Where the number of pupils with a given defect in any school district is sufficiently large (say from 10 to 15), the establishment of special classes should be made compulsory by state law. When the number is not sufficiently large the law should provide for the transfer of the pupil at the expense of the district to an adjoining school district having accommodations in the proper type of class. When proper instruction cannot be afforded in day classes or at home the pupils should be placed in the proper state institution.

The state should grant a special subvention for the maintenance of special day classes under conditions which insure efficient instruction. It is of prime importance to secure properly qualified teachers in all kinds of special classes. Before teachers are appointed, they should have been given special training bearing on the types of handicapped pupils which they expect to train. In addition to the work of instruction the teachers might well do some of the social work connected with their particular problems. For this extra preparation and service they should receive increased emolument.

The compulsory reporting of defective children, particularly the deaf, blind, crippled, and suspected feeble-minded, to the state department of education or some other state department would be a great aid in securing for these pupils the attention they require.

The educational work in all types of state institutions should

be under the supervision of the state department of education. The supervision now usually extends only to the institutions for the blind and the deaf.

RECOMMENDATIONS REGARDING SPECIAL TYPES OF CHILDREN.

Owing to the demands of brevity, we can offer only a few recommendations regarding some types of defectives.

THE CRIPPLED.

Public day classes should be established for children who are disabled but not diseased. Operative cases should be sent to hospitals and children with bone tuberculosis should be transferred to convalescent homes in the country. Pupils who are unable to get to the day school should be brought thither in omnibuses, at the expense of the community or of philanthropic organizations which are willing to render this service. The school rooms, preferably on the ground floor, should be supplied with special or adjustable chairs, appliances for orthopedic gymnastics and equipment for appropriate literary, industrial and vocational training.

THE BLIND AND VISUALLY HANDICAPPED.

The application of a 1% or 2% solution of silver nitrate to the eyes of the infant immediately after birth should be made mandatory by law.¹⁴ The adoption of this harmless expedient will result in the prevention of an enormous amount of blindness. Since 1880, when the etiology and prophylaxis of ophthalmia neonatorum were discovered, there has been a slight decrease in the proportion of blind under the age of 5, the percentage for each decade from 1860 being as follows:

1860	1870	1880	1890	1900	1910
2.5%	1.6	1.9	1.5	1.0	1.0

The reduction of 8% in the prevalence of ophthalmia neonatorum during the last decade among children entering schools

14. See the North Carolina Act of 1917, in the "Third Annual Report of the National Committee for the Prevention of Blindness," for 1917. 20% of the pupils in the state school for the blind in that state in 1915-1916 were reported as ophthalmia neonatorum cases.

for the blind is largely ascribed to the timely use of gonorrheal antiseptic. The reduction will doubtless be much greater if the use of the antiseptic is made universal.

Public school provisions must include not only classes for the blind but also "conservation of vision" classes for children with extreme uncorrectable myopia, congenital cataracts, nystagmus and corneal opacities. In the latter classes large use should be made of the oral method of presentation, of books printed in large type, and of individual blackboards which may be placed at the proper distance from the child. The child should be trained for a vocation in which his visual defect will not be a serious handicap.

THE DEAF AND THE HARD-OF-HEARING.

In addition to the classes for the totally deaf, the public schools should establish separate "conservation of hearing" classes for the very hard-of-hearing, in which the aim should be, through the use of the oral method, to conserve and develop the limited amount of hearing which remains, and to develop the child's speech. Through lip reading the eye can be trained to supplement the ear. At the same time, large use should be made of the visual method of appeal in these classes. The children should be prepared for vocations in which the hearing defect will least handicap them. Children who are clearly feeble-minded should not be accepted in the conservation of hearing or conservation of vision classes.

A large amount of the deafness due to remediable causes (venereal infection, inflammation of the middle ear through infection from the throat, etc.), should have been prevented. It is inhuman, and should be regarded as criminal, to permit a child to become deaf when the remedy is near at hand. Children with otitis media should be obliged to undergo treatment. Teachers should watch for running ears and symptoms of deafness, and report suspected pupils to the inspector of hygiene or urge upon parents the necessity of having the child treated before permanent damage has been done to the essential mechanism of hearing. Neglect has deprived many children of a whole world of sensations and burdened them with a permanent handicap.

SPEECH DEFECTIVES.

All the teachers in the kindergarten and the first two grades should be given special training in phonics, and in the correct

articulation and pronunciation of English words, not only in order that they may lay a correct foundation for the oral work in English for all the children, but in order that the large number of children annually entering the schools who present simple or uncomplicated types of speech handicap may receive proper speech attention at the very beginning of their school career. The number of speech defectives entering the schools is so great that it is not probable that a sufficiently large staff of special speech teachers can be secured in most schools to reach them all. Moreover, properly trained the kindergarten and primary teachers would be able to successfully treat most of the cases of baby talk, lisping, indistinct enunciation, careless, slovenly pronunciation and mispronunciation. Most of these impediments are not due to organic defects, but to the acquisition of bad habits of speech either accidentally or through the imitation of faulty models. The more complicated cases of cluttering, lolling, lisping, stuttering, nasality, etc., require the services of the well trained speech teacher, while some speech disorders yield only to psychological analysis and medical and surgical treatment. Ideally the first step in the treatment of all complicated or serious forms of speech disorder should be a mental and physical examination. Many speech disorders are associated with mental deficiency or mental disturbances, while others are associated with organic defects or functional nervous disturbances. The physical treatment, when indicated, should precede the educational and psychological. Speech defect in the incurable hard-of-hearing responds best to the oral method used in training the deaf to speak. The employment of visiting speech teachers is probably more economical than the establishment of special speech centers, although it is advisable to congregate the more serious types (particularly stutterers) in special speech classes. Moreover, it is often necessary to establish proper condition and secure proper co-operation from the home if permanent improvement is to be secured.¹⁵

SUBNORMALS.

All grades of the feeble-minded except idiots and low grade imbeciles (all of whom attain a mental development of less than 5 years) are proper subjects for public school education. They are most successfully trained in centers apart from the ele-

15. On the treatment of speech defects, consult E. W. Scripture's *Stuttering and Lisping*, 1912, and C. S. Bluemel's *Stammering and Cognitive Defects of Speech*, 1913 (Both of these books contain references to other treatises).

mentary schools and apart from other types of special classes, such as the classes for 'incurable,' truants or backward pupils. No child should be assigned to a class for the feeble-minded unless he has been properly certified as a result of a careful investigation of his history and present mental and physical condition. It is most important that the child be given a careful psychological examination. The majority of candidates should be tried out in the kindergarten and first grade before they are reported, while children who cannot be definitely certified as a result of the examination to be mentally defective, should be given the benefit of the doubt and be assigned to ungraded classes for further trial under most favorable conditions. The general administration of the special classes should be lodged in the director of the Psycho-Educational Clinic, who should be a well-trained psycho-educationalist who has specialized on defective children and psychological and educational diagnosis. The staff of the clinic should be made so large that it can serve as the clearing house for all types of mentally, morally and educationally deviating children.

The curriculum for mental defectives should include the rudiments of the literary branches, which should be presented concretely and in correlation with practical industrial problems; sensori-motor exercises; industrial training; physical training; moral training, mostly habituation in correct modes of response; speech improvement and correction; and musical training. The guiding aim of the program of studies in the special school for mental defectives should be distinctly practical rather than cultural.

The problem of retarded pupils cannot be successfully handled in the elementary schools unless a system of ungraded classes is organized, (in addition to the special schools) for the borderline, all-around backward and retarded-restoration types, who are far more numerous than the feeble-minded. It is advisable to locate these classes in the elementary school buildings or grounds,¹⁶ so that the pupils may take advantage of the

16. Details for the organization of ungraded classes may be found in "Problems of Subnormality," 1917, pp. 278-331.

The following are among the most important books dealing with feeble-minded and backward children of interest to educators, social workers, and psychologists:

Anderson, Meta L.

Education of Defectives in the Public Schools, 1917.

Barr, Martin W.

"Mental Defectives, Their Treatment and Education," 1910.

Binet, Alfred, and Simon, Th.

"Mentally Defective Children," 1914.

"The Boston Way," compiled by the Special Class Teachers of Boston, 1917.

general social activities of the school. At the same time, it would be advisable to have two or three classes in an ungraded center, in order to insure better grading of pupils. The restoration cases should be given intensive coaching in the literary branches, with a view to return to the regular grades as soon as possible, while the borderline and backward children should be given a considerable amount of literary work, presented concretely and objectively, during their younger years. As it becomes evident with the lapse of years that these pupils possess little ability to deal with literary and abstract subject matter, the amount of time devoted to handwork should be increased. The literary work should be presented in correlation with the handwork. The children who eventually prove to be feeble-minded should be transferred to the special schools, where a greater amount of time should be devoted to appropriate forms of monumental training than is advisable to give to this work in the ungraded classes, while the borderline and backward pupils should be transferred to elementary industrial schools at the age of from 12 to 14, depending upon the upper limit of the compulsory attendance law. It should be evident from the above plan that the ungraded classes will serve as a clearing house in conjunction with the clinic for children of doubtful diagnosis.

There is plenty of work to be done in the world calling for the services of borderline and very backward or dull people. We must have our "hewers of wood and drawers of water." But there is little, if any, need in modern civilization for the feeble-minded, as above defined. We must forsooth train all the feeble-minded who come into existence who are improvable, but it would be more important to prevent the birth or development of any more in the future. It has been said that if all the feeble-minded now in existence could be colonized or sterilized, the feeble-minded progeny would disappear in one or two

Bridle, Marion F.

Special School Work, 1917.

Bronner, Augusta F.

"The Psychology of Special Abilities and Disabilities," 1917.

Doll, Edgar. Clinical Studies in Feeble-Mindedness, 1917.

Groszmann, M. P. E.

"The Exceptional Child," 1917.

Holmes, Arthur. "Backward Children," 1915.

Holmes, Wm. H. "School Organization and the Individual Child," 1912.

Miner, J. B. Deficiency and Delinquency, 1918.

Mitchell, David. "Schools and Classes for Exceptional Children," Cleveland Foundation, 1916.

Shuttleworth, G. E., and Potts, W. A. "Mentally Deficient Children," 1916.

Tredgold, A. F.

"Mental Deficiency," 1914.

Witmer, Lightner (and others). "The Special Class for Backward Children," 1911.

Wrightson, Hilda A. "Games and Exercises for Mental Defectives," 1916.

generations. Unfortunately there is no evidence to justify such an optimistic outlook. There are many "carriers" of feeble-mindedness, themselves not feeble-minded, who probably could never be recognized as carriers. For years we have gathered heredity data on thousands of feeble-minded and backward children whom we have examined individually. We are forced to admit that we have not found such grave cacogenic conditions as have been reported from some institutions. Of thousands of parents (mostly mothers, however) of my clinic cases whom I have had occasion to interview only a very few, possibly only a score, could have, or should have been certified for commitment to an institution for the feeble-minded. Possibly the record would have been worse had I conferred with all the parents, both mothers and fathers. Those who did not come may have been of the lower order of mentality. And yet, my conclusions are in accord with those of Walter E. Fernald, a careful student of long experience with the feeble-minded under institutional care: "The average family chart of the patients admitted to the Massachusetts School for the Feeble-Minded is not a 'black' chart. . . . The average defective coming to the institution is not the child of a feeble-minded parent or parents. Indeed, comparatively few of the parents observed would ever have been considered as candidates for segregation, even in the cases where the feeble-mindedness was undoubtedly of hereditary origin." (Ungraded, 1918, 172f.) Doubtless we shall be able to reduce the number of the feeble-minded by colonization, by sterilization, and also by the prevention of ante-natal and natal trauma, early infections, injuries and parental inebriety, and by the employment of anti-luetic¹⁷ and organotherapeutic treatment¹⁸ in indicated cases; but we shall probably always have feeble-minded people for whom society must make provision. The proposal to eliminate these people by euthanasia need not be very seriously considered in the

17. Persons suffering from active venereal diseases should be quarantined until the danger of infection is over.

18. Much emphasis has recently been placed on the relation of perverted functioning in the endocrin system to mental deficiency. Of scores of children under prolonged glandular treatment under the supervision of neurologists, whom we have examined during the last few years, only a few have shown any considerable mental improvement, exclusive of cretin or cretinoid cases due to hypothyroidism. Pupils reported as restored through the administration of pineal or pituitary extracts or adrenalin we have been obliged to retain in our special schools as mental defectives. Reports which are based only on favorable cases may have made us over sanguine. We need statistics on a large number of cases which have been followed up for years, before we can speak definitely regarding the types of glandular cases which will improve to any considerable extent from the administration of glandular extract. The value of thyroid extract in infantile myxedema has been demonstrated. It is held that there are eight or more types of infantilism, but in many of these the mental defect does not amount to feeble-mindedness.

present stage of opinion on that question. We will do well to assume a conservative attitude toward the whole problem of feeble-mindedness until science has justified a more optimistic outlook.

Doubtless some of the recommendations which we have made with respect to the different types of defectives discussed above will seem to some quite utopian, even within the limits of our practical suggestions.

Let us add, finally, that the entire program outlined in this essay for the efficient care and training of mentally and physically handicapped children, will be partly frustrated unless the private and parochial schools are also required to inspect their pupils physically and mentally and to provide differentiated training to meet the defects found in the pupils. There is no good reason why private schools should be granted a charter for doing the State's work, unless they discharge their trust as efficiently as the State-supported schools.

Editor's note: The foregoing article by Dr. Wallin was originally requested by us as a chapter for a projected book: Problems of Educational Reconstruction. Unfortunately, however, our plans for the volume have recently fallen through, and Dr. Wallin has very graciously permitted us to publish the material in the JOURNAL. To any of our readers who may desire additional copies of the article, we shall be pleased to furnish them at twenty-five cents per copy.

PUBLICATIONS RECEIVED

FORSYTH DENTAL INFIRMARY FOR CHILDREN.

Fifth annual report. Boston, January, 1920. 43 pp. Ill.

Contents include a general statement in regard to the Infirmary and its purposes, personnel of the committee and staff, the director's report to the trustees, departmental reports and statements, etc.

FRANCIS W. PARKER SCHOOL STUDIES IN EDUCATION. Published by the Faculty of the School.

Vol. 6, 1920. Chicago, The Francis W. Parker School, 1920. 45 cents. 161 pp.

The theme of this latest volume of the Studies concerns itself with the individual and the curriculum and experiments in adaptation. The subjects discussed at some length include: the individual project method; social interests in the classroom; thrift as an element in good citizenship; the function of art in the course of study; etc.

CHILD HEALTH PROGRAMS FOR PARENT-TEACHER ASSOCIATIONS AND WOMEN'S CLUBS. Issued by the

Bureau of Education, Washington. *Health Education* No. 5. 1920. 16 pp.

The material has been prepared to answer a country-wide demand. Parent-teacher associations and women's clubs have felt the need of definite study along the lines of child health, in order to guide adequately the health program of their own schools.

A local group can undertake the study of all or part of this wide field of work, giving one meeting to each topic. It is suggested, however, that all groups give an initial meeting to the consideration of "Teaching health in our schools," as the other special topics of the program are considered from this particular viewpoint. The meetings should take the form of conferences rather than lectures, the leaders preparing themselves by means of the special bibliography outlined.

A special topic is devoted to methods of publicity and organization that have been found effective in awakening the interest of communities and public officials.

The lessons include "Teaching Health in Our Schools," "School Lunches," "Nutritional Classes," "Correction of Physical Defects," "Recreation," "Our Teachers' Health," "School Sanitation," and "Good Housekeeping in the Schools."

THE ENGINES OF THE HUMAN BODY. By Arthur Keith, M. D., L. L. D., F. R. S. Conservator of Museum and Hunterian Professor, Royal College of Surgeons of England, etc., etc. Philadelphia, Lippincott, 1920. 284 pp. Plates.

Being the substance of Christmas Lectures given at the Royal Institution of Great Britain, 1916-17. On such an occasion as the Christmas lectures at the Institution the technical terms used in a medical college are out of place; a fresh machinery for the display of old facts must be devised. For this reason the author went to the workshop of the engineer and selected examples of his inventive ability to illustrate the creative genius of Nature as manifest in the human body. Inasmuch as the lectures were addressed to a "juvenile auditory" they must perforce be rendered not only simple in language but interesting to boys and girls as young as ten and twelve years of age. The muscles are the motor engines of the human body and they follow the principle of internal combustion in a special way which man has not yet been able either to improve or to approximate. The bones are living levers of which the foot and the fore-arm are interesting types. Cartilages and oil-glands comprise a most efficient lubricating system. The heart is a double-pump whose "head of pressure" is maintained in the arteries. The lungs are a pair of living bellows, working now slowly, now very rapidly. The workshops and laboratories of the human body, where food is turned into fuel for the tissues, are composed of an alimentary tract which is likened to the alimentary system of a motor-cycle. So with the other important physiological processes of the body.

The author, it appears to us, has succeeded so well in his professed endeavor to make the principles of human anatomy and physiology intelligible to young students as to have actually made them *interesting*—which is perhaps as high a tribute as could be paid to any writer on physiology. It is not difficult to imagine the bright eyes and interested faces of boys and girls which were upturned to Dr. Keith as he unfolded lecture by lecture the wonderful mechanism of the human body, which was after all only a *living* engine.

THE CHILD'S DAY. By Woods Hutchinson, M. D. (Revised Edition) Boston, Houghton Mifflin Company, 1920. 186 pp. Ill. \$0.76.

A sketch of the usual course and activities of a child's day, with a running commentary of explanation, and such outlines of our bodily structure and needs as are required to make clear why such and such a course is advisable and such another inadvisable. The sections include *Waking up, Breakfast, Going to School, In School, "Absent to-day," Work and Play, The Evening Meal, A Pleasant Evening, Good Night*, etc. The book is interestingly written in language comprehensible to boys and girls in the intermediate grades, and should prove a valuable addition to the growing number of hygiene readers adaptable to the growing child.

A HANDBOOK OF HEALTH. By Woods Hutchinson. (Revised Edition) Boston, Houghton Mifflin Company, 1920. 341 pp. Ill. \$1.12.

Presents in language within the comprehension of the boy and girl the best information and advice of the medical profession for a proper understanding of the body and the best way to run it efficiently. Two-thirds or more of the text is devoted to hygiene and sanitation, with a minimum treatment of anatomy and physiology. The subject of food as fundamental health is discussed with exceptional fulness. *A Handbook of Health* is designed for the use of children in Grades VII and VIII.

COMMUNITY HYGIENE. By Woods Hutchinson. (Revised Edition) Boston, Houghton Mifflin Company, 1920. 314 pp. Ill. \$0.96.

With the awakening of the social consciousness, we are beginning to realize that the concern for health involves more than the individual. It is a community problem, and the earlier children are led to cooperate with one another, with parent and teacher, and with the community at large, for the promotion of public health, the better it will be for all. *Community Hygiene* is a series of plain, common-sense talks to children on how the home, the school, and the community cooperate to make them strong, healthy, useful citizens. The book is prepared especially for children in grades V and VI.

A new and very practical feature of the revised editions of each of the three books in this series is the addition at the end of four pages of "setting up" exercises (fifteen exercises in each case) drawn from the *Official Handbook of the Boy Scouts of America*. Each book is further provided with a set of suggestive questions for the teacher. Taken together, the three books offer an elastic course in physiology and hygiene for children in Grades III-VIII.

GYMNASTIC DANCING. By S. C. Staley and D. M. Lowery. Adopted by the Y. M. C. A. Physical Directors' Society. New York, The Association Press, 1920. 212 pp. Ill.

The term "gymnastic dance" has come to have certain definite implications which make it the direct opposite of the "esthetic dance"; the latter implies grace, complexity, and femininity; the former implies vigor, simplicity, and masculinity. The present volume was prepared primarily for men and boys. Gymnastic dancing being such a large factor in the majority of physical training programs of the present day, a need exists for a work on this general subject. An effort was made in producing the book to hold to fundamentals: "practicability" has been given precedence over everything. The writers believe that their offering will be of service in three respective fields: (1) to standardize the nomenclature of gymnastic dancing; (2) to serve as a textbook in schools of physical education; and (3) to serve as a source book for the formation of gymnastic dances.

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SOME HYGIENE PROJECTS FOR THE UPPER GRADES

By LAWRENCE AUGUSTUS AVERILL

Editor of *The American Journal of School Hygiene*

If there is one subject of study in the school curriculum that above all others offers opportunity for project work, it is the subject of hygiene and sanitation. If there is one subject of study in the curriculum that is most unfruitful of results when handled in the orthodox textbook-lecture method, it is the subject of hygiene. If there is one subject of study which should exert a large influence over the future lives of individuals, that subject is hygiene. If there is one subject of study that has failed notably in its manifest purpose, that subject is hygiene.

All this by way of introduction to the point of this paper, which is that the subject of hygiene can be made just as fascinating and just as permanently of value as any other of the common branches ordinarily pursued by boys and girls of school age. In fact, because of the immediate and profound relationship between personal and community hygiene, on the one hand, and the life and happiness of human beings on the other, it is doubtful if any other subject in the whole curriculum is fraught with such possibilities of compelling interest and purpose for boys and girls, provided only that the proper methods of handling the matter be followed by the teacher. In this paper we shall be concerned especially with such methods as

are particularly applicable to the upper grades, *i. e.*, the seventh and above, although they should prove just as workable with children in the intermediate grades.

In the first place a word should be said concerning the organization of the class for hygiene work. By all means, do away with the old-fashioned "recitation" idea. Let the room be democratized as far as it is feasible during the hygiene period if at no other time. Lead each child to feel that he is a part of a small community which is met together to discuss matters pertaining to the welfare not only of the miniature school society but also of the wider community beyond the school premises. One of the greatest evils in our present day education lies in the strange paradox that school precepts too often do not leave the school grounds when the children do. Instruction is a sort of fickle dog that comes leaping to meet the owner when he enters the school premises, plays and capers around him interestingly during the day, but which, when the session closes, slinks into the shadows of the yard the while the master passes out the gate into the outer world, not loth to be rid of his pestiferous companion. There is not that mutual and constant relationship between the two existences of the child which should naturally be the case. Everyone knows that there is a schoolroom language and an outside language, for example; a schoolroom attitude and an outside attitude; a schoolroom civics and an outside civics; even a schoolroom spirit, voice, mood, initiative (or rather lack of it), courtesy, industry, posture, etc., and an outside spirit, voice, mood, initiative, courtesy, industry, posture, etc. And most of all there is—or certainly has been in the near past—a schoolroom hygiene and an outside hygiene: a schoolroom conception of health and an outside practice of it and interest in it. Children have been encouraged to talk glibly of physiological processes and hygienic or sanitary principles, but all too rarely indeed, in the experience of the writer, has such glibness become an incentive for modifying or enriching or supplementing the way of living of most individuals who have sat their allotted span of years under the perennial exhortations of lecturer-teachers or drunk enfeebling and deenergizing draughts from poured-in textbooks.

And so, I say, beware of the old-fashioned methods of teaching hygiene. They may do very well for teaching Greek, or archæology, or perhaps even agriculture in a girls' seminary, but for virile training of boys and girls in practical and usable health habits and attitudes—never. Such training must be emi-

nently a *participative* process, a *cooperative* process, a *one-hundred-percent-enrollment* process. And how shall we organize the hygiene class in order to give a chance to this participative process? In a certain school which the writer knows the children have been organized into what is called a "Keep-Fit Club." Such other suggested names as "Good Health Club," "Health League," "Sound Body Club," etc., were forthwith dismissed from consideration by the children as not being so challenging, so *pioneering* as "Keep-Fit Club." Possibly the soldier *motif* was at the basis of this feeling on the children's part.

The club elects one of its numbers president, another vice-president, and a third secretary. In addition to these officials, there is also a committee on meetings to which the teacher, *ex-officio*, belongs, and which with her determines upon interesting projects to be performed by the club. No one—not even the teacher—would think of referring to the weekly club meeting as a *class*, much less a *recitation*. It is rather a *Club* meeting. The president presides, save when the vice-president is able by sound logic to wrest temporarily the chairmanship of the meeting from the hands of the chief executive. Nominally, he is to direct the club in its discussion of the project which chances to be up for consideration. Actually, however, the children need little guidance. Occasionally, it is true, they stray away somewhat from the set topic, but they usually find themselves shortly, and as time goes on they diverge less and less from the aim which they have set up for themselves for the meeting. Interest at the meetings of course runs high. Personal experience is more and more often summoned up as the year progresses, and gradually some of the children even become so bold as to venture to propose and defend opinions of their own which may be quite at variance with those of others—surely an innovation in most throne-rooms. The offices of president and vice-president rotate around the class in the course of the year, so that the best principles of democracy are always in evidence even in the political complexion of the club. The teacher moves dimly across the background of the club setting, but her presence and part are decidedly inconspicuous. Textbooks and hygiene readers are always available and often furnish the entire groundwork for a meeting. Pictures and posters and varieties of other illustrative materials are always to be had in abundance. Initiative, self-control, self-reliance, independence and suspension of judgment, argumentative resourcefulness and other attitudes and attributes of mind are developed, as

well as courtesy, broad-mindedness and—above all, perhaps—an intelligent and apparently permanent interest in the general subject of hygiene and health.

Following are some suggested projects in hygiene and sanitation which have and should—attacked in a socialized way—prove interesting and valuable to all upper grade classes. They do not by any means exhaust the list of possibilities, but merely enumerate several lines of investigation that are exceptionally valuable and essentially practicable in the carrying out.

1. **Grading of public markets.** For this project it will only be necessary for the club to determine arbitrarily upon some scheme of grading, and then to assign as many as possible of the local markets to the various teams for studying and ranking upon the basis agreed upon. A scale of 100 is always an excellent working basis, inasmuch as the children are quite familiar with it in connection with their own individual school ranks. 90 or better might be determined upon as representing highest quality of sanitation in each classification; between 75 and 90 might represent varying degrees of fair quality; between 50 and 75 might indicate poor quality; while a score lower than 50 might be understood as representing an unsatisfactory condition of sanitation. The several classifications upon which the markets are to be ranked should include the following: (1) general cleanliness; (2) protection of foods on display; (3) neatness and cleanliness of clerks; (4) condition of screening and absence of flies; (5) care in the handling of unprotected foods; (6) freshness of perishable stuffs; (7) ventilation; (8) refrigeration.

With a team of two or more boys and girls responsible for investigating, scoring and reporting back to the club upon the sanitary appointments and conditions of a specific market, very valuable and significant results should be obtained. Interest in the topic and the desire to make no errors will inspire the children, before finally checking up their results, to make frequent visits to their stores, develop in them keenness in observation, niceness of judgment, and broaden their conceptions of what society has a right to expect and demand of dealers in foods designed for human consumption.

2. **Learning about the local board of health.** The carrying out of this project, too, may be delegated to several teams. One will find out the names of the persons on the board; how, when, and for how long they are appointed or elected; what their salaries are; and whether or not they are physicians or laymen.

Another will concern itself with the financial phase, finding out from available reports how much it costs the city annually to maintain its board of health; what portion of the income from taxation is thus used up, etc., etc. There will be abundant opportunity here for correlation with arithmetic. Still another team will investigate the various duties and activities which the community has a right to expect of its health officials, and in how far the present board is meeting these expectations. It will be a revelation to most of the children to discover that the work of the health department is classifiable into a considerable number of divisions or bureaus, each one of which nominally at least exercises some measure of control over the general health, comfort and happiness of the community. In addition to all of these lines of attack, a group might very profitably make a survey of the leading health welfare agencies of the community, apart from the established board of health, and report in club meeting upon the activities of these private or philanthropic organizations. In this way the children will come to appreciate something of the value and field for individual participation in looking after the health of the group. Public boards of health are indispensable, they should come to feel, but after they have fulfilled all their proper functions there yet remain ample opportunities and necessity for charitable enterprise on the part of public-spirited citizens and societies.

3. **Finding out about local disease incidence.** Most local boards of health issue monthly statistics covering the incidence and extent of communicable and other disease during the preceding thirty days. Only relatively few citizens are aware of the type and prevalence of disease, or of the fact that exact information on the subject is available periodically from the health department. It has been the experience of most civics and hygiene teachers that older children take an absorbing and healthfully impersonal interest in the death rate and disease incidence of their own community. For a child to be taught that the mortality rate for tuberculosis, or for pneumonia, or for typhoid fever for the registration area of the United States is such and such a percent is likely to have little if any lasting impression. But for the same child to keep watch of the rates for his own city, whether for the purpose of comparing them with those of some other locality or mere informational purposes concerning home, the result is quite different. The hygiene club may well consider this absorbing topic, perhaps, keeping pin-mats on the walls during the winter months, show-

ing at a glance not only the predominating diseases of the season, but their distribution over the city as well. One group of children may work upon the problem of how to read local mortality statistics, and whether the same method of tabulation and reduction is exemplified in the state and national statistics. Another group may plot and explain curves of prominent diseases in the community. Still another group may interview the health authorities and inform the club how the department manages the mechanical side of keeping its fingers tolerably accurately and constantly upon the health pulse of the community. Finally, an enterprising team may secure all possible information as to the organization and functions of the state board of health in so far as they relate to the tabulation and publication of disease statistics. In this way the children may get some practical notion of the niceness of articulation of local with state and even with national departments.

After the first reaction of stupefaction on the part of the health officers of the city to find the growing citizens manifesting an interested concern in their work has passed, they will not only be willing but glad to render to their youthful interlocutors an account of their stewardship of the city's choicest treasure-in-store: its health. It may also result in setting them to thinking as they have never thought before upon their responsibilities and opportunities. No doubt they will be glad to furnish a speaker from their department on request who might bring to the boys and girls of the club a most interesting as well as compelling message.

4. Investigating the city water supply. Excellent opportunity for a field trip will be offered in the prosecution of this project. This may either be made on a holiday, or Saturday, or perhaps after school. At all events unless the reservoirs are too inaccessible every effort should be made to have the club actually visit and study them. Ordinarily the city water department will be able to supply the services of someone of its force as guide and "lecturer" for the short time which the club and teacher can devote to the actual inspection of the preserve. In the event that the system is situated too far away, or a field trip to its vicinity is otherwise infeasible, at least the lecturer should be invited to tell the club something about what a city water department means in size, extent, cost of upkeep, planning for future expansion, purification, filtration, etc., etc.

But before the club is ready for this information, it will need to investigate a little for itself. One team will find it an inter-

esting project to learn the exact source or sources whence the city reservoirs derive their supply. Home geography may be correlated here very nicely. Another team will study the purification and filtration processes; another the pressure and pumping systems; another the nature and location of the mains beneath the city streets; another the house-pipes, meters, shut-offs, etc. Pictures of the old Roman aqueducts—obtainable in the Perry pictures and elsewhere—will serve to add interest to the whole fascinating story of man's perennial and often herculean efforts to force pure water across great distances from an abundant source of supply to his own common habitation.

5. **Learning about the milk supply.** This is always an interesting topic to investigate. One team will set itself the task of determining roughly how much milk is required daily to meet the demands of local consumption. A second team will study the chief sources of supply of this food, together with the main routes of its importation into the city. A fourth will make a survey of the number of local distributors; the length of their routes; glaring cases of distributive duplication—such for example as when four different milk teams were noted by one child to be delivering milk daily in a single short street on which there were six houses. A fifth will inquire into the precautions required to be taken by dealers and distributors and producers in order that the purity and cleanliness of the milk supply may be safeguarded. A sixth will report upon the values and cheapness of milk as a food. Still other teams may study such related topics as Pasteurization, distribution centres, care of containers, cost of producing milk, cost of transportation, etc., etc. Ample opportunity all along the line is offered for correlation with arithmetic.

6. **Studying local methods of garbage and sewage disposal.** So far as the writer's experience goes, whatever attention so-called "hygiene" classes of the past have given to the disposal of wastes has been almost purely academic. No bigger problem, however, confronts most municipalities than the satisfactory disposal of their garbage and sewage. Study of the whole problem should occupy a recognized place in all school-rooms where older children are taught. One team may report upon articles of food that are frequently wasted by careless housewives. Another team may compute the actual volume of garbage which the city has to remove weekly. Another team may study the workings of the reduction plant, provided the municipality maintains one, or of whatever method is employed

for the final disposition of garbage. If a piggery is maintained another team may keep track of the profit and loss side of this phase of municipal operation.

On the side of sewage, one group will study ordinary house plumbing, traps, drains, etc.; another the work of the purification plant; another the construction of sewers under the city; another the local methods of sewage reduction and final disposal; another, the financial aspect for the city. Pictures and drawings of the old Roman sewers; the reading of Victor Hugo's fascinating description of the gigantic sewers of Paris in *Les Misérables*; a field trip to the local works; and the projection upon the screen of slides obtainable from most municipal engineering departments will add much interest to the project.

7. Finding out how diseases are spread. This constitutes a much more valuable field of study on the part of boys and girls than does a mastery of the intricacies of the body circulations, glandular secretions, nervous pathways, etc., etc. One team may experiment elementarily with yeast as a typical bacterium; another may investigate the fascinating story of the conquest of yellow fever, thus studying a common protozoan disease; another may tabulate graphically the number of people who die locally from preventable communicable disease; another may report upon certain sanitary principles and precautions to be observed in the care of the sick; another may learn about toxins and antitoxins, etc. Any number of specific contagious diseases, such as the ordinary so-called children's diseases, may be studied by different groups. One group may work out a set of "health rules" to be presented to the club for discussion and possible adoption as club mottoes, slogans, etc. Other related topics under this caption should include: care of wounds; open windows; ventilation of schools, theatres, public buildings, etc.; individual and common drinking cups; spitting in public places or in public conveyances; vaccination; outdoor sports and exercise, etc., etc. The spreading of disease is a topic broad enough to include practically everything in any way related to the activities and deliberations of any "Keep-Fit Club."

8. Finding out about the fly nuisance. The most favorable time of year for entering upon this project will be obviously in the spring, just at the beginning of the fly season. One team will find out how flies are able to carry about with them the germs of disease. (There are now available excellent slides

covering this whole topic.) A team will report upon the life history of the fly. The entire club membership will divide itself into teams for the purpose of investigating all possible breeding places for flies in their several neighborhoods. Subsequently some or all of them will learn about the methods of treatment of breeding sources in order to render them safe, and will actually so treat them, reporting upon their results in club meeting. Fly-traps may be constructed in manual training class and attached by the children to their own garbage pails at home. Local newspapers may be requested to give some interesting publicity to the work which the club is doing in the extermination of the common house fly. It will prove an interesting related project in arithmetic to calculate the expense which the people of the community are obliged to bear annually in the screening of their doors and windows against the fly intruder, to say nothing of the remarkable variety and array of fly-papers and poisons that clutter their homes and stores! The state boards of health will be glad to supply without charge abundant literature dealing with the whole matter of the fly nuisance. "Fly weeks" may be entered into, in conjunction with "Keep-Fit Clubs" of other schools, and the attention and interest of the entire community may be enlisted toward the possible abatement of the fly nuisance from the neighborhood.

A similar project aimed against the mosquito may be worked out by the club, and prosecuted with similar good results.

Conclusion. The foregoing projects represent only a few of a very large number of interesting and important problems—all related to the health and happiness and comfort of the community—which any enterprising school system may substitute for the old-fashioned "physiology" that used to be (and still is?) administered in generous doses to passive boys and girls. All that is needed on the part of the teacher is the conviction that these perpetual doses never have attained permanent fruit in resulting positive health attitudes in the children dosed. Wrong motives, wrong notions of educational values, and confused and mistaken educational aims have cooperated to maintain this negatively threadbare pedagogy. The writer recommends that, in place of the older practice in this regard, a practical and significant series of projects in community or personal hygiene and sanitation be inaugurated in our upper elementary and high school grades. The possible number of such projects is limited only by the ability of the teacher to conceive them and opportunity and time on the part of the children to

carry them out. For the rural school too, obviously, the same possibility exists of building a course of study in hygiene that will exemplify to the children the fundamentals of rural health and interpret to them the essential facts of wise and intelligent citizenship.

THE EYESIGHT OF SCHOOL CHILDREN*

By J. H. BERKOWITZ

One of the most valuable of the recent publications by the Bureau of Education is a study of the eyesight of school children, prepared by J. H. Berkowitz. The complete title of this publication: *The eyesight of School Children as related to school environment, and methods of prevention and correction* indicates its scope and general purpose. The bulletin represents the results of a comprehensive survey of the nature and extent of defective vision in school children, and of the preventable causes within the schools to which may be attributed eye strain and the general deterioration of visual capacity. It includes in addition to these data a discussion of prophylactic measures adopted in various school systems, both in this country and elsewhere, together with a summary of the most significant literature bearing upon the whole problem of lighting and other conditions affecting the vision of children both in and outside of the schoolroom.

Among the several related topics developed at some length by the author are: defective vision as related to retardation; the extent of defective vision among school children; environmental conditions unfavorable to eyesight; classroom lighting; educational hygiene and prophylaxis; graphic methods for educational hygiene; detection of defects; observation and recording; special classes for the semi-blind; correctional procedure; value of follow-up work; school clinics; the provision of eyeglasses; the cost of eyeglasses in various cities; compulsory treatment; needed standardization for schools; etc., etc.

The attached appendices contain much material of value and suggestiveness. Appendix I, for example, represents a part of the Report on Influence of Schoolbooks upon eyesight, made in 1913 by the British

*Published as Bulletin 65, 1919, of the United States Bureau of Education. Washington, D. C., Government Printing Office, 1920. 128 pp. Ill. Abstracted by the Editor.

Association for the Advancement of Science, and includes specimen type recommended for school books to be used by children of various ages. Appendix VII contains reproductions of the standard test cards and charts to be used by the examiner in testing the vision of literates and illiterates.

A bibliography of general references, carefully selected and annotated, completes the monograph. The JOURNAL heartily commends this bulletin to the attention of teachers, superintendents and school physicians. There is hardly a more important question before educational hygienists today than that which relates to the safeguarding and conserving of the eyesight of school children. According to the final report of the Provost Marshal General to the Secretary of War, one out of every ten drafted men who had to be rejected in the late war was rejected because of some serious eye deficiency. It would be futile to attempt to defend the opinion that all this defectiveness was traceable directly to schoolroom influences. The inference is almost unescapable, however, that those influences in a very great number of instances aggravated the condition of visual defectiveness and so, indirectly if not directly, contributed to increase the percentage of rejections on these grounds. We can not afford to neglect the investigation of a problem so fraught with possibilities of danger as that which centers about the conservation of the vision of school children.

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